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Aerial Nuisances from the Refining and Burning of Petroleum Oils*

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THE question of whether pollution of outdoor air by offensive odors should be considered a public health matter has occasioned more or less difference of opinion in the past. Most health officials have inclined to the opinion that while such odors might be offensive and thereby constitute a nuisance, they do not directly cause disease, and therefore cannot be considered as affecting the public health. There is, however, a somewhat different interpretation which may be placed on the terms " health " and " odor." An odor considered purely in its olfactory sense as something which may be smelled, may not cause specific and lasting disease although it may be offensive. Nevertheless, such an odor may be so repulsive to certain persons as to cause reflex action of the nervous and muscular systems leading to digestive and other systemic disturbance which will seriously interfere with regular performance of ordinary duties. Frequently repeated, such disturbances may also readily affect the general health of the individual, causing a lowered vitality and a decreased resistance to disease.

Many substances which affect the olfactory senses are direct poisons, or cause irritation of the mucous surfaces, rendering them more susceptible to infection. On the other hand, certain gaseous substances, such as carbon monoxide, are direct poisons, although they are entirely odorless. The first produce reactions which may be termed psychological, while the others produce a true physiological reaction. There is, however, no sharp line of demarcation between

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these two classes of reactions nor between the aerial conveyed bodies which produce them. Odors arising from so-called nuisances are frequently made up of a mixture of gases and finely divided particles of solid or liquid matters in suspension, the effect of the odor being the combined effect of its components, which may set up both sets of reactions simultaneously.

The sense of smell and the reaction to different odors or irritants varies widely in different persons. A concentration of odor which might pass unnoticed by the majority might be disagreeable to a considerable number, and extremely offensive and irritating to a comparatively few; yet these few may suffer severely if the visitation of this particular odor is frequent or long continued. Because the olfactory sense in such persons is more highly developed is no reason why they should be termed cranks or neurotics. Public health in a broad sense must include the few as well as the many.

By reducing or eliminating atmospheric pollution by offensive odors we may be building better than we know. In the days when water purification was in its infancy health authorities were much surprised to find that by bringing purified water into typhoid ridden communities not only was the death rate from water-borne disease reduced but there was also a marked falling off in the death rate from other diseases. This effect is known as the Mills-Reinke phenomenon. If such a striking phenomenon followed a clean-up of the public water supplies, may we not expect some similar phenomenon to result from a clean-up of public air supplies. Under such a premise the abatement of offensive odor nuisances and the correction of atmospheric pollution becomes a proper field for extended activity by the public health engineer.

As a rule, cases of atmospheric pollution affect a relatively small area, and the number of people exposed is so small that the real health hazard, if any, cannot be studied to advantage. Perhaps it is for this reason that so little authentic information is available as to the effect on health of the pollution of outdoor air by offensive odors.

THE PROVIDENCE ODOR INVESTIGATION

In Rhode Island the power to abate nuisances is vested entirely in the municipal authorities, and the State Health Department acts only in an advisory capacity, and on the request of local authorities. In 1919, however, complaints that public health was being jeopardized by an odor nuisance in the Providence Metropolitan area became so numerous and so widespread that the General Assembly at its 1920 session ordered an investigation by the State Board of Health. In

this investigation, which was conducted by the writer, we endeavored to cover 3 principal points: (1) The origin of the odors and the cause thereof. (2) The degree of magnitude of the nuisance, that is, the frequency and duration of the odor manifestations, the intensity of the odor at different times and at different places, and the area and population affected. (3) The effect, if any, of the odors upon the health of persons residing in the affected areas.

Interesting as they may be, time does not permit me to discuss the methods and results of this investigation, except in so far as they are related to the public health phase of the problem.

Although it was at first believed that the nuisance was originating from 2 plants, 1 engaged in the refining of crude petroleum and the other in the manufacture of asphalt from petroleum, it developed that odor nuisances affecting the same general territory were originating from at least 4 large oil burning power plants—a gas works, a plant manufacturing road binders and other products from gas tar, a plant manufacturing ammonia from gas liquors, and a slaughter house and rendering establishment. In addition, oil burning installations for heating a number of office buildings and commercial establishments, and a considerable number of private homes were believed to be contributing to the nuisance. In a study of the public health phase of the problem, therefore, we had to take into consideration not only the possible effect of the volatile constituents arising from the breakdown of crude petroleum under distillation, but also the effect of gases, etc., produced by more or less complete combustion of petroleum oils, and the effect of substances given off from the other industrial processes noted.

The total area subject to the effect of these odors was about 23 square miles with a resident population of over 126,000. In one of the 3 districts into which this area was divided for study, an offensive odor nuisance was recorded on 112 of the 158 days this district was under observation. In the other 2 districts, odor nuisances were recorded on 75 out of 121 days, and on 57 out of 148 days respectively.

We attempted to obtain data as to the public health phase of this problem by two methods: By employing a qualified physician, who had had experience in industrial hygiene, to make a special inquiry among persons who claimed their health was being affected by the odors; and by a letter of inquiry, or questionnaire, sent to all practicing physicians in the state, requesting full information as to patients under their care who had apparently been made ill by the odors, or whose illness from other causes was being aggravated by the odors. The physicians were also asked to express their opinion as to the

effect of offensive odors in general, and certain volatile or gaseous substances in particular, upon both normal persons and persons who were suffering from certain diseases.

HEALTH SURVEY IN ODOR AFFECTED AREA

In our direct investigation among the residents of the odor affected districts it was impossible because of lack of funds to make a house-to-house canvass to obtain full and complete statistics. However, it was possible to interview something like 300 different persons, mostly complainants, scattered throughout these districts, and to obtain from them complete data as to the effect of the odors upon various members of their families. This inquiry therefore covered a representative population of about 1,000 to 1,200, among whom were found 89 who were being made ill by the odors, or whose illness from other causes was being aggravated by the odors. To this number may be added 7 additional cases reported by physicians, making a total of 96 cases of which we were able to obtain a complete history. Seventy-five were females and 21 males. It might be stated that in my experience women and children appear to be more susceptible to obnoxious odors than are men. The large preponderance of women in this particular case, however, may have been due in part to the fact that visits were made only in the daytime and a large proportion of the persons interviewed were women.

The most common symptoms complained of were irritation of the throat, suffocation or choking sensation, nausea, headache, dizziness, and malaise. Twenty-four persons stated that the odors would wake them from a sound sleep. Seventy-seven persons exhibited two or more symptoms, 46 gave a history of three or more symptoms, and 14 a history of four or more symptoms.

In a considerable number of cases, those affected would be awakened by a suffocating or choking sensation, which would be followed by nausea. A number of persons complained of a dizziness so marked that they were unable to get up to shut the windows. In quite a large

TABLE I

Symptom	*Number of Persons*
Nausea	56
Headache	44
Irritation of throat	42
Suffocation	27
Malaise	25
Dizziness	22
Choking sensation	13
Irritation of nose	5
Irritation of eyes	2
Gastric trouble	2

proportion of cases it was stated that the nausea, dizziness, and headache persisted into the following day, many hours after the odors had ceased to be noticeable. The number of persons exhibiting the various symptoms is given in Table I.

OPINIONS OF PHYSICIANS

In the letter inquiry among practicing physicians, about 725 questionnaires were sent out, and 190 replies were received. Ten physicians reported data on 32 patients who were being affected by the odors, 7 of whom had not been picked up in our canvass of complainants. The symptoms reported are shown in Table II.

TABLE II

Symptom	*Number of Persons*
Headache, cyanosis, pains in chest and abdomen	10
Nausea and vomiting	6
Nausea and malaise	6
Nausea, headache and insomnia	3
Nausea, suffocation and sore throat	3
Headache and suffocation	2
Nausea, headache, insomnia and suffocation	1
Nausea, headache and loss of appetite	1

Nine physicians also reported having 15 patients ill with other diseases whose condition was being unfavorably affected by exposure to the odors. The types of cases reported included pulmonary tuberculosis, asthma, pharyngitis, laryngitis, cardiac trouble, and nervous diseases.

The opinions of this group of physicians as to the effect of certain volatile and gaseous constituents probably present in the air of the affected districts is interesting as showing the trend of medical opinion at the time. Between 120 and 150 physicians replied to our various questions relating to this point, the majority of opinions being that air polluted by the volatile constituents of petroleum, by sulphides, or by sulphur dioxide, might affect the health of normal persons, and would certainly affect unfavorably the health of persons suffering from respiratory or nervous diseases or from asthma.

CONCLUSIONS

If we compare the list of symptoms produced in the 96 persons recorded as being made ill by odors with the symptoms which are known to be produced by the volatile and gaseous constituents which escape into the air in the distillation of crude petroleum, or from the stacks of plants using oil as fuel, we find that they are practically identical.

It is well recognized that the vapors and gases from the process of distillation of crude petroleum may produce both acute and chronic symptoms. Benzine, for example, in the proportion of 50 p.p.m. in air is extremely poisonous and in a concentration of 20 p.p.m. produces local symptoms. The still gases from

refineries handling high sulphur oils contain sulphides, either as organic sulphides or as hydrogen sulphide, and also probably carbon bisulphide, all of which are highly poisonous and produce symptomatic disturbances when diluted with considerable volumes of air. During combustion these sulphides are converted to sulphur dioxide and in some cases to sulphur trioxide, both of which affect the respiratory and digestive systems. With incomplete combustion, such as was frequently observed in our study of oil burning plants, carbon monoxide may be given off in considerable quantities.

The chain of circumstantial evidence seems to be complete that the illness of 96 persons was caused by atmospheric pollution arising from destructive distillation of high sulphur petroleum or from the use of such petroleum oils in large quantities for fuel.

Owing to the closure of the Mexican oil fields by revolutionary disturbances, the petroleum brought to Rhode Island for refining and for use as fuel in recent years has been of relatively low sulphur content. While the writer has occasionally noted odors in these formerly odor-ridden districts, their frequency and intensity have been very largely reduced, and complaints from residents have practically ceased. Nevertheless, while the atmospheric pollution by odoriferous and irritating sulphur compounds has been greatly reduced, they must still be present in small amounts, and there can have been no material reduction in the pollution by non-odorous volatile petroleum constituents. It would be interesting if a resurvey of this district could be made to determine whether former complainants had been cured of their ailments, or they had merely stopped complaining because they could not smell the atmospheric pollution which must still exist in greater or less measure.

DISCUSSION

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THE discusser has read the paper on "Aerial Nuisance from Refining and Burning of Petroleum Oils" and does not feel competent to discuss intelligently the effect of such odors on the public health. This he feels is a medical, physiological, or psychological problem requiring more the attention of a physician than an engineer. Neither is the writer able to discuss intelligently the interesting question raised by Mr. Gage of a possible application of the principle of the Mills-Reinke phenomenon in connection with the control of industrial odors, but he feels that this is something to be hoped for.

So far as major nuisances are concerned in Massachusetts, however, the statutes link comfort with public health, and the writer has had considerable to do with the determination of the extent of such nuisances and their correction. There is little doubt of the effect of certain offensive industrial odors, at times at least, on the public comfort, and it can perhaps sometimes be shown that offensive industrial odors have an effect upon persons suffering from nervous disorders.

It must be pointed out that the workmen in industrial plants are generally well endowed with health. Probably the fairest way to determine the effect of industrial odors on public health is to study the returns on the cases of respiratory diseases in a community subject to industrial odors and make a comparison with the returns from other industrial communities not subject to offensive odors. The

writer believes that the results of certain industrial odors have more of an effect upon the public comfort than those arising from the pollution of streams, and feels that this problem of the control of industrial odors is much more in the public mind, and is likely to continue so, than is the problem of stream pollution purely from a nuisance standpoint.

Some 13 years ago 3 sizeable oil refineries were established in Massachusetts and engaged in the refining of crude oil obtained largely from Mexican fields. This contained large quantities of sulphur, and the escape of sulphuretted hydrogen during processing was a particularly disturbing factor to the residents in the vicinity. In fact, in one instance the odors were known to affect a considerable portion of the Boston Metropolitan District for a distance of 8 to 10 miles. After many minor remedies were made at a cost of several thousands of dollars, it still appeared impossible to control the situation, and the matter was brought into court resulting in a verdict against the company. The court ordered the company to install numerous additional odor elimination devices, but about this time there was a change in the crude oil market, and the company was reorganized. The crudes were changed to those containing less sulphur, and there has since been little complaint.

The writer also investigated for the Massachusetts Department of Public Health in 1922 another large oil refining establishment. Odor control devices and careful policing resulted in a temporary relief from offensive odors, but nevertheless the matter was brought before the courts, and there is an interesting decision in Strachan and others vs. Beacon Oil Company (see 251 Mass. 479). This went through the Supreme Court of Massachusetts with a finding decidedly in favor of the company. The following is quoted from the decision:

". . . The defendant is engaged in a lawful business in the conduct of which it is found that odors necessarily will escape into the air; but it also appears that the defendant has adopted the most approved methods and devices to control and confine such odors at an expense of many thousands of dollars; it also is further found that such odors would not be unbearable or injurious to the health of normal persons. . . . Whether there is a nuisance in a certain locality depends upon the attendant circumstances including the character of the neighborhood, the acts complained of, and their effect upon the comfort or health of people in general. The district where the defendant's plant is situated has for many years been increasingly devoted to manufacturing purposes; some of the plants were there located many years ago and from some of them odors are thrown off at times which are offensive and disagreeable, but as those discharged by the defendant are not injurious to the lives or health of normal persons, it cannot be held that a nuisance exists in view of the findings of the master to the contrary.

"It is a matter of common knowledge that in thickly settled manufacturing communities, the atmosphere is inevitably impregnated with disagreeable odors and impurities. This is one of the annoyances and inconveniences which every one in such a neighborhood must endure. Mere discomfort caused by such conditions without injury to life or health cannot be ruled as matter of law to constitute a nuisance. Each case must depend upon its own facts and no rule can be formulated which will be applicable to all cases. Rogers v. Elliott, 146 Mass. 349. Downing v. Elliott, 182 Mass. 28. Stevens v. Rockport Granite Co., supra. . . ."

The area in which this industry is located is one of the most intensively developed industrial districts in New England. Complaints continued to come

in, and the Legislature of 1932 passed a resolve, Chapter 40, providing for an investigation by the Department of Public Health. This resolve is in part as follows:

"Resolved, That the department of public health is hereby authorized and directed to investigate the causes of offensive odors, fumes and gases emanating from industrial processes and other sources in the cities of Everett and Chelsea and to determine the effect, if any, of such odors, fumes and gases upon the public health and comfort. For the purposes of this resolve, said department may enter the premises of any person or corporation in the said territory, shall have access to such records and plans relating to odor elimination devices as are on file in the offices of the various corporations therein, and may employ such engineering and other assistance as may be necessary.

"Said department shall report to the general court its findings and its recommendations, if any, together with drafts of legislation necessary for carrying such recommendations into effect. . . ."

An appropriation of $5,000 was made and the investigation is now well under way. It is inadvisable, of course, to report at present the results or the determination of the department as to the effect of the odors, if any, upon the public health and comfort, as the work has not been completed. The investigation is to include a study of the reported cases of respiratory diseases.

The district includes a large oil refinery, a large chemical works, gas works, varnish plants, etc. The investigation has shown that sulphur compounds of various kinds originate in certain processes and that one of the particularly offensive odors from the refining of oils is of the mercaptan group, frequently referred to by complainants as an onion or garlic odor.

An adaptation of the Palmer dust apparatus has been used in this investigation as in the earlier ones for the determination of SO_2 in the air.

The investigation has indicated that probably one of the most offensive sources of nuisance to contend with in this region is that due to the disposal of acid sludge which is a result of treating crude gasoline with acid for the removal of impurities. This material after treatment is used for fuel purposes, and it is hoped that the study will show a suitable method of disposal. Another source of odor observed is that due to the disposal of large quantities of liquid wastes containing offensive oily substances, and samples of some of these wastes, even when diluted 1 part in 100 million parts of air by volume in the laboratory, have given off perceptible odors. The life of certain pipe lines used for conveying hot oils, gases, and other substances, in certain processes in these industries is very short, and frequent replacements are required in the pipe lines and valves at intervals of 6 months to a year. In recent years an improvement has been made in these pipes by using steel with a larger chronium content, the material being known to the trade as "Enduro." This investigation has indicated not only the necessity of odor control devices but the careful policing of the industries if the conditions complained of are to be corrected.

This whole matter of the detection and elimination of industrial odors and the effect on health was the subject of a symposium before the American Society of Civil Engineers in 1925 which can be found in their *Transactions*, Vol. 89, 1926, p. 339, and while there have been changes and improvements this symposium is perhaps the most comprehensive of any similar series of papers available.

The Bacteriology of the Intestinal Pathogens*

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THE isolation and identification of pathogenic bacteria from the intestinal tract is one of the most difficult bacteriological problems which confront a public health laboratory. Their isolation, on the one hand, is attended by many technical pitfalls, and, on the other, the administrative control of this important group of diseases rests largely on the results obtained in the laboratory. Any significant organisms which may be found require intelligent and careful work for their identification. The technical difficulties involved require special training and experience; a thorough knowledge of bacteriological methods and principles is necessary for accurate results. There seems at present no way for the inexperienced worker to acquire this knowledge except through actual experience, and often at the expense of serious error. One is impressed, in studying the available treatises on diagnostic methods, by the casual manner in which the bacteriology of the intestinal infections has been handled. Perhaps the chief reason for this is the very lack of uniformity in methods, and their multiplicity, but the result is that many clinical laboratories, as well as some of the smaller public health laboratories, make little attempt to interest themselves in the practical applications of bacteriologic methods in the diagnosis of this group of infections.

The subject falls into 3 divisions: (1) preservation of the specimen; (2) methods for isolation, and (3) identification of significant organisms. Each of these is important, but the preservation and isolation usually present the greatest difficulties. Many special media have been described, particularly for the isolation of the typhoid group, while the preservation of feces for bacteriological study has not received the attention which it seems to deserve. Almost every bacteriologist has his favorite procedures which are more or less successful in his own hands; consequently, he hesitates to accept new methods or modifications of old ones.

* Read before the Laboratory Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 24, 1932.

Even when the isolation procedures can be started promptly with the freshly-passed stool, some means of preserving the specimen for further study are desirable, because it has been our experience that repeated platings materially increase the number of positive results. In most public health laboratories considerable time is bound to elapse between the collection of the specimen and its arrival at the laboratory, and this delay makes some good preservative medium the first essential of a reliable examination.

After one is assured of a properly preserved specimen, the successful isolation of any pathogen which may be present is determined not only by the media used but also by the care with which the plates are streaked. The well-nigh universal practice of permitting this important step to rest upon a single plate or series of plates prepared at the same time is comparable to reporting a blood culture negative after only 24 hours' incubation. A good preservative medium permits survival of *B. typhosus* and related organisms for several days, with a progressive diminution of the fecal flora. When the original number of typhoid bacilli is small, colonies will frequently appear on plates streaked the second or third day, after further decrease of the fecal bacteria has occurred.

Furthermore, a plating medium which has a sharp selective action will permit the development of typhoid colonies, when another, which is less effective in inhibiting the colon group, will give entirely negative results. Our own observations indicate that *B. typhosus* survives a long time in feces; it is not so much its early death which causes negative results as the enormous overgrowth of *B. coli* which prevents the appearance of the typhoid colonies on the plates.

The identification of members of the typhoid-paratyphoid group, in the hands of competent bacteriologists, usually offers no difficulties. Dissociative changes may sometimes make a particular strain atypical in certain respects, but the sum total of a thorough cultural study, together with the serological reactions, usually makes the identification certain. There should surely be no excuse for confusing *B. proteus* with *B. typhosus*, nor should a strain of *B. coli* merely because it happens to ferment lactose slowly, be mistaken for a dysentery bacillus. Everyone who has had extended experience with fecal bacteriology, has found numerous unclassifiable bacteria which sufficiently resemble the established pathogenic types to cause at least momentary confusion. Some of these differ culturally only in their reaction on a single carbohydrate; but, serologically, they cannot be brought into relationship with any known species. On the other hand, some strains show such overlapping, both in cultural and serologic characteristics

as to make classification difficult, if not impossible. Whether these organisms are variants of known types, and whether they are even pathogenic, there is no evidence on which to base an opinion, but their chief bacteriological importance seems to lie in their confusing resemblance to known pathogens, with the consequent necessity for their differentiation in arriving at the etiologic agent in any given case.

In addition to these technical phases of the subject there are field problems of prime importance to a thorough and intelligent understanding of the mode of spread of the enteric diseases. The significance of the healthy carrier in the causation of outbreaks, the geographic distribution of carriers, the relation of subclinical infections to the carrier condition, are questions which require close coöperation between the epidemiologist and the bacteriologist for the most effective solution. The antigenic relationships in the dysentery and Salmonella groups and the practical significance of the different antigenic components of these bacteria are other problems which await additional knowledge before their full epidemiologic applications can be intelligently evaluated.

Public health laboratories are depended upon for by far the larger portion of intestinal bacteriology. Carrier surveys must often be made on an extensive scale, and convalescent cultures must be dependable. Upon the results of the laboratory rests the effective control of the enteric infections. I know of no service which the Committee on Standard Methods of this section could render which would be of more value, particularly to the small laboratory, than to create some degree of order out of the technical chaos which now exists. It is essential that the results of official laboratories be comparable. The need, therefore, for special study of bacteriologic procedure, and group judgment as to the best methods for official examinations, especially of typhoid carriers and convalescent cultures, is urgent.

This is not the place to discuss technical details, but it seems to me that a study of the various phases of the subject could do much to clarify the situation, even if full agreement were not reached with regard to all procedures. The thorough-going investigation of complement fixation in syphilis which Dr. Ruth Gilbert has made as referee for the committee, while it has not evolved a technic which is acceptable in every detail to all laboratories, did serve a very important purpose in emphasizing some of the current technical faults, and undoubtedly resulted in a general improvement in methods and results.

A similar approach might be made to the subject of the intestinal pathogens. Criteria could be established for minimum acceptability which would probably receive practically universal agreement by the

larger laboratories and be very helpful to smaller ones which are handicapped by lack of extensive material on which to base their judgments and interpretations.

These minimum requirements, it seems to me, should include general specifications for satisfactory preservative media, the use of selective media for isolation and acceptable procedures for identification, including the essentials for classification, both cultural and serological. Reasonable standards covering these phases of technic should meet little difficulty in gaining acceptance and should increase the effectiveness of many laboratories in this particular field.

Anthony van Leeuwenhoek

THE year 1932 was the 300th anniversary of the birth of Van Leeuwenhoek. Although a drygoods merchant devoid of medical training, he became interested in facts concerning the body, and made a communication to the Royal Society of London in 1673 concerning the blood, in which he states that he had oftentimes wondered of what parts it consisted. Finally he took blood out of his own hand and found "small, round globuls driven through a Crystalline humidity or water." He doubted that all blood was like this and noticed that in the small amounts examined, color was practically absent. This communication is said "to have shaken that august body to its foundations."

We remember him, however, chiefly on account of his improvement in the microscope. Up to his time, the highest magnification had been from 25 to 30 times, while van Leeuwenhoek was able to increase this to from 80 to 270 times. He is said to have owned 247 microscopes and 419 lenses, most of which he ground himself. He was the first to describe spermatozoa; he discovered the striations in voluntary muscle; the structure of the crystalline lens; demonstrated anew the capillary anastomoses between arteries and veins; described what is called animalculae in water in 1675; found microörganisms about the teeth, and was the first to draw bacterial chains, clumps, rods and spirilla. One of his communications was made to the Philosophical Society of London in 1675. He was elected F.R.S.

His death took place in 1723 at the age of 91. He is buried in the Old Church at Delft, and the epitaph on his monument ends with the following words: "As everybody, O Wanderer, has respect for old age and wonderful parts, tread this spot with respect; here grey science lies buried with Leeuwenhoek."—Abstract, *Canad. M. A. J.*, Nov., 1932.

Maternal Mortality Study for Cleveland, Ohio*

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A COMPLETE and detailed study has been attempted of every puerperal death occurring within the confines of the City of Cleveland during 1931. This includes the deaths of women from all causes dependent more or less directly upon pregnancy at any stage of gestation and upon parturition. It requires a careful scrutiny of every death recorded as puerperal by the local Bureau of Vital Statistics of the City Division of Health. It includes so-called "Criminal Abortions," which are usually classified as homicides. These are as truly puerperal as those following self-induced or therapeutic abortions, and they should be included in any complete study of puerperal mortality. Every coroner's case involving the puerperal state has been investigated thoroughly. The deaths of all females between the ages of 15 and 50 years also have been checked against the live births and stillbirths. Every association between them, suggested by similarity of name, place of residence or of birth, and time of birth, has been followed up to determine possible puerperal relationships. The official number of puerperal deaths in Cleveland during 1931 was 117. This study revealed 151 puerperal deaths, including the 12 criminal abortions, which could be so classified.

Basic data in addition have been secured from individual physicians, midwives, hospital records, and the Visiting Nurse Association. The items have been recorded on schedules prepared by an advisory committee of the U. S. Children's Bureau. They have been analyzed in the office of the Cleveland Child Health Association. This study was undertaken with the approval of the Academy of Medicine of Cleveland and was made possible by the thorough coöperation of the Cleveland Division of Health, individual physicians, maternity and general hospitals, coroner's office, and the Visiting Nurse Association.

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* Summary of paper read before the Child Hygiene Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 26, 1932. The complete paper with tables and charts will be published elsewhere.

During 1931 there were 16,279 live births and 592 stillbirths. Of those born alive, 496 died under 2 weeks of age and 527 under 1 month. There were 151 puerperal deaths, giving a puerperal mortality rate of 9.3 per 1,000 live births or 8.9 per 1,000 live births and stillbirths. The official puerperal mortality rate based upon 117 recorded deaths was 7.2 per 1,000 live births.

It is highly desirable that a distinction be made between viable births, which may be expected to survive, and those which have little possibility of living. In this study there were puerperal deaths following 50 abortions, 8 ruptured ectopics, and 7 undelivered, all under 28 weeks of uterogestation, and 2 undelivered over 28 weeks. This leaves only 84 viable births. A maternal mortality rate based on this number would be 5.2 per 1,000 live births. Thus it is seen that after removing all abortion deaths there remains a fairly high maternal mortality rate.

In this study every fetus under 28 weeks of gestation is considered as non-viable and its premature expulsion is classified as an abortion. Of the 50 puerperal deaths following abortion 16 were spontaneous, 14 self-induced, 12 criminal, 6 therapeutic, and 2 of unknown origin. The primary causes of death following these abortions were sepsis alone in 35 cases, hemorrhage alone in 7, sepsis with hemorrhage in 2, and 1 case each of embolism, lung abscess, myocarditis, toxemia, intestinal obstruction, and pulmonary tuberculosis. Abortions, therefore, make up one-third of the total puerperal deaths. In over 70 per cent of these abortions sepsis was the primary cause of death. In 42 of the abortion cases there was no prenatal care, in 5 the care was inadequate, and in only 3 could it be considered adequate. Following 31 of the abortions some operative procedures were instituted. In very few of the abortions was it possible to secure any prenatal care. It is misleading, therefore, to make any comparison of maternal mortality in the community at large, where all deaths from abortions are included, with the mortality among maternity cases under intensive care after the middle of pregnancy.

Abortion undoubtedly has been on the increase since the World War. This condition may be one of the main factors in the stationary or increasing puerperal mortality rates in this country. It can be shown from other data that it is fallacious to compare maternal mortality rates in the United States with those in other countries, where definition of terms, methods of classification, and interpretation of records differ widely. Even in the Cleveland study 33 puerperal deaths of the 151 were subject to diagnoses or interpretations different from those recorded in the original death certificates.

Of the 1,679 registered physicians in Cleveland, 853 attended one or more of 16,005 live and stillbirths during 1931, or 95 per cent of the total births. About one-sixth of the physicians had over 20 confinements. The majority had 5 or less during the year; 80 physicians listed as obstetricians and gynecologists attended approximately 34 per cent of the births, 773 general practitioners 61 per cent, and midwives 5 per cent. Nine osteopaths handled 27 obstetrical cases during 1931.

The 151 puerperal deaths occurred in the practice of 109 physicians and 9 midwives. Fifty-five of these occurred in the practice of 33 physicians listed as obstetricians and gynecologists, 87 in the practice of 76 general practitioners, and 9 in the hands of 9 midwives. In other words, 36 per cent of the maternal deaths were handled by specialists, 58 per cent by general practitioners, and 6 per cent by midwives.

Approximately 60 per cent of the total live and stillbirths (10,115 confinements) occurred in 31 hospitals; 85 per cent of the puerperal deaths occurred in these same hospitals. The maternal mortality rates varied greatly depending upon the nature of the hospital, composition of staff, and selection of cases. The exclusively maternity hospitals showed the lowest rates (combined rate 5.9 per 1,000 live births) as contrasted with the general hospitals with maternity licenses (rate 14.4). If comparison be made on the basis of viable births only the rates in the maternity and general hospitals closely approach one another. The city hospital, however, to which all types of cases are referred, had an exceptionally high mortality. The puerperal mortality rate for the 6,756 home cases was 3.5 per 1,000 live births as compared with 13.1 in the hospitals as a whole. It should be noted, however, that practically all the deaths following abortion and many of the complicated deliveries occurred in the hospitals. However, if all abortion deaths are eliminated, the hospital rate still remains considerably higher than that in the homes.

There were 98 registered midwives in Cleveland in 1931. Of these 87 attended 811 live births and 9 stillbirths. Nine puerperal deaths occurred among cases with which the midwife had anything to do. Every puerperal death in which a midwife contact could be traced was credited to the midwife and not to the doctor signing the death certificate. Five of the 9 puerperal deaths followed criminal abortions induced by midwives and later turned over to physicians. All of these died of sepsis. One midwife's case with a difficult impacted shoulder was delivered by a physician and died of sepsis. Three deaths occurred suddenly, apparently from emboli, on the 3rd, 8th, and 36th

day after normal deliveries. If we exclude the abortion deaths, we find that the puerperal mortality rate among viable cases in midwives' practice (5.0) is still lower than that among physicians' cases (6.3 per 1,000 live births).

The primary causes of death among the 84 women giving birth to viable fetuses were as follows: puerperal septicemia 19; various accidents of labor including cesarean section, instrumentation, surgical interference, version, etc., 18; toxemias of pregnancy 12; puerperal hemorrhage 8; emboli 8; other accidents of pregnancy 6; lobar pneumonia 4; pulmonary tuberculosis 2; puerperal psychosis 2; and 1 death each from scarlet fever, influenza, cerebrospinal meningitis, chronic nephritis, and anesthetic shock. One of the undelivered cases died of bronchopneumonia, and the other was an anesthetic death.

As contributing or secondary causes, accidents of labor took first place with 21 cases, pneumonia came second with 15 cases, and diseases of the heart third with 14 cases. It is seen, therefore, that while a number of different conditions may play a secondary or contributing part, the puerperal state itself was mainly responsible for the deaths, with sepsis as the leading cause and accidents of labor and toxemias as close seconds.

There were 12 deaths following classical cesarean section, and 4 following cervical section. Eight deaths followed internal podalic version and extraction, and 7 followed breech extraction. The number of deaths, following forceps delivery were as follows: "prophylactic forceps" 4, low forceps 16, mid-forceps 3, and high forceps 1, a total of 24 forceps deliveries. In 28 cases only were the deliveries spontaneous.

Other analyses from the basic data will bring out factors relating to age distribution and parity, length of time attended by physician, adequacy of prenatal care, birthplace, marital status, and occupation. It also will be possible, with the aid of data assembled by Howard Whipple Green, to indicate distribution of births, puerperal deaths, stillbirths, and deaths under 1 month, in economic areas comprised of census tracts having equivalent monthly rental values.

CONCLUSIONS

1. Factors entering into puerperal mortality are so interwoven with the social, economic, and cultural fabric of the community that it is impossible to evaluate them without a detailed study of each individual case.

2. Comparison of maternal mortality rates for different communities is misleading unless definition of terms, methods of collecting data, and interpretation of records are comparable.

3. Deaths following abortion should be separated from deaths after the 28th week of uterogestation to gain a true picture of the situation.

4. The midwife, aside from abortions, plays a relatively minor rôle in contributing to the high maternal mortality rate.

5. Sepsis, toxemias and hemorrhage play the major tragic rôles, and these are associated largely with hurried, operative, and bizarre obstetrics.

6. Prenatal care and hospitalization are accessories to the actual obstetric situation. They may or may not be associated with a low maternal mortality, depending upon the type of medical, nursing, and hospital care afforded.

7. Not every maternal death is, at present, preventable. Fundamental changes must take place in the socio-economic order and more complete medical knowledge and skill be available in order to approach this ideal.

Bovine Tuberculosis

JENSEN asks, " Is bovine infection in man so extensive and the cause of so much serious disease that more effective measures against it than those already in force are needed? "

For 9 years he has isolated and typed tubercle bacilli from various tuberculous lesions. Some 400 cultures have been studied with the following results: 37 cases of pleural effusion, 36 bovine, 1 human; urino-genital, 16 cases, 13 human, 3 bovine; cerebrospinal fluid, ratio of human to the bovine type, 34 to 11; cervical glands, 23 cases human, 31 bovine. Other forms of surgical tuberculosis, 68 human, 5 bovine. He finds that tuberculosis of the glands of the neck traceable to the bovine type is at least as frequent as the human in Copenhagen as in the provinces. He answers his own question emphatically in the affirmative.—Abstr. by C. Lillingston in *Bull. Hyg.*, Nov., 1932, p. 710.

Motivation in Health Education*

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HEALTH education we may take to mean the sum of all efforts to modify human conduct and attitudes so as to raise the health level of individuals or of the community. It includes the education of the diabetic or of the tuberculous in his personal regimen, propaganda for immunizing children against diphtheria or smallpox, and the promotion of sales of cod liver oil or tooth pastes. In such education the most frequent appeal in the past has been to fear. If you eat green apples you will get the gripes. If you don't brush your teeth the goblins will get you. Horrible pictures of smallpox victims, horrible statistics of deaths from preventable diseases, horrible reminders of aches and pains, horrible portraits of rickety children—horrible devices of various sorts to arouse horror.

We could make out a good case for the appeal to fear on strictly logical grounds. We can still hear the reverberating echoes of the solemn dictum that " self-preservation is the first law of nature," even if we are not exactly clear as to what it means; and with that first law as a major premise we can rationalize taking the easier way of trying to scare people into being healthy. But that would hardly be a demonstration of the effectiveness of the technic. Of course, people are influenced by fear; of course a burned child dreads the fire; but we still have to answer the question—How can we most effectively influence people's conduct in the direction of maintaining or of improving their health?

To demonstrate the effectiveness of the appeal to fear we can point to the thousands who no longer shake the hands of those they meet, who never kiss those they love, who polish the tableware in hotels and restaurants with their napkins, and who shield their babies not only from the evil eye but from the false lips of lady friends and politicians. We can also point to the entire armies that boil all the water they take internally, as well as to entire counties or larger governmental units in which the inhabitants always close their windows at night to avoid malaria—a practice which is said to account for the salubrious atmos-

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phere of country districts. Granting that the various practices and avoidances are desirable in the interests of health, it is still questionable whether they can be best established at the risk of cultivating phobias and hypochondrias. We can learn to sterilize water or wipe our soup-spoons in public places as standard practice without encouraging the imagination to dwell upon the frightful possibilities of neglect, just as we can establish routine vaccinations and routine Wassermanns without making the flesh creep.

A state of panic is itself undesirable, from a health point of view. Moreover, it interferes with our purposes when considerations of health demand the doing of something rather than the avoidance of dangers—as for example, taking exercise, maintaining erect posture, breathing deeply, chewing thoroughly. We may learn from the manufacturers of soaps and antiseptics and tooth brushes, who have at stake large capital investments and other overhead expenses, and who presumably are searching for the most economical uses of their advertising appropriations—these people have been redirecting the attention of their prospects from the danger of losing teeth or of having them ache, to the satisfactions of handsome teeth or lasting teeth, for example. They have shifted the emphasis from the fear of repelling potential admirers of the opposite sex through body odors or foul breath to the satisfaction that may ensue from making oneself attractive.

It is perhaps significant that when the reliance upon fear in health education was questioned or criticised, the only positive motivations that we could think of were those related to competitive self-aggrandizement. For many years the only alternative to the horrible examples offered young people as inducements to sobriety were in the form of keeping fit campaigns; and keeping fit was commonly glorified as the sure and only means of excelling others in athletic contests.

The solemn inculcation of good rules of conduct designed to maintain health still proceeds over large areas on the assumption that the one grand goal of youthful aspiration is the urge to run faster, jump higher, hit harder, or sit tighter—as in a tug-of-war—than the other fellow. This is supplemented frequently with appealing pictures of two-fisted he-men and, for the girls, pictures of champion golf or tennis players, hurdle riders and channel swimmers. It is only the stupid boys and girls who fail to grasp the connection between observing the rules of health and winning championships. Now while the establishment of this connection in the minds and hearts of young people is not only legitimate but highly desirable, we have to realize (1) that many of these young people do not care in the slightest degree for the

prowess or distinction of athletic achievement; and (2) that most of those who do care can never attain to championship status and therefore are either going to be discouraged and disillusioned by their failure to reap the promised benefits of their efforts and sacrifices, or, being wise enough to see the catch early, are going to avoid the disappointments by dismissing the contest in advance. There is the need, in other words, of recognizing the fallacy of promising, as an inducement to adopt our health programs, either what our prospects do not want, or what we cannot deliver.

On the other hand, keeping fit has values that are unrelated to the competitive strivings, whether in athletics or business. It is worth while for the man or woman of independent means, and for the solitary genius, to be in good health, although these individuals never come into competition with anybody, although they are without care for achieving " more " of anything, although they do not seek to advance themselves. It is worth while to be well, to make some effort toward attaining health, regardless of the particular rivals that have been introduced to stimulate us—health is a factor in the pursuit of any purpose. It is the fact that human beings have such purposes, that they do set themselves goals, which supplies the motivation, not the fact that in many of the relationships we find ourselves adopting competitive attitudes. People want to be effective: sleep has some bearing on one's effectivenss; elimination of refuse from the tissues and from the body has some bearing on one's effectiveness; a steady hand has some bearing on one's effectiveness. Health is of value in play as well as in work, in the contemplative life as well as in the life of action, in the solitary strivings as well as in the joint struggles against others. But again it becomes unnecessary so to emphasize the various health measures that the rituals and practices obscure their purpose: it is not necessary or desirable to make the pursuit of health a major objective of life.

That there is danger of doing just this appears when parents and teachers and physicians put a premium upon eating spinach or breathing through the nose: There must be something deep and mystical about these performances to make adults so awfully solemn. A little boy whose parents had impressed him with the utter goodness of George Washington, with his perfect compliance with all that is right and proper, startled his mother one day by asking, after a period of silent meditation, " Mums, did George Washington have good bowel movement? "

It is not rare for parents to pay children for being " good," for saying their prayers, for taking the afternoon nap, for gulping the cod

liver oil. Perhaps it is not fair to blame the parents for using the easiest way to get done what we have assured them it is well to get done: but while these procedures teach their lessons, we can hardly consider them as sound parts of health education. They are instead part of the confusion of values which does so much to break down health—mental health. A little girl who had been treated for enuresis by means of graded rewards succeeded in increasing her control satisfactorily. After several months had passed, she was again brought to the clinic because of a serious regression. The doctor asked the child what the trouble was. She replied very simply and directly that she needed a certain doll which she had seen in a shop window.

Paying a child a nickel for taking his nap may be effective, just as paying him a nickel for jumping out of bed promptly may be effective, in insuring the desired conduct. However, it is not health education; it is no more health education than is rewarding care of the teeth with candy or penalizing refusal to take cod liver oil by confinement in the dark. Such procedures establish merely a technic of buying and selling, with a corresponding scale of exchange values—a scale and a technic that do not promote health, that rather injure health.

A questionable use of irrelevant inducements to comply with prescribed usage for the sake of health may be seen in the awarding of lollypops and buttons and laudations in connection with a diphtheria immunization campaign. A community which uses lollypops to induce children to come to the clinic can probably get a higher percentage of attendance than one which uses merely a newspaper announcement that the clinic will be held. A clinic which rewards each child with a star for accepting the prick of the needle will perhaps show a larger percentage of submissions than one which overlooks each child in the line beyond applying the needle, or which merely pats his head and murmurs, " That's a fine boy! "—or " girl," as the case may be.

Undoubtedly the physiological effects of the immunization procedure are uninfluenced by the methods used for inducing the children to come and to submit. There may be by-products, however, that also have significance for the health of the community. There is, for example, the potential snobbery of the star-bearers toward the untouchables. There is further the potential inferiority and envy and resentment of the children who, for whatever reason, fail to be gathered into the charmed circle of the elect. A promising research problem would be to follow up a successful sales campaign of this kind with an inquiry as to the number of anti-vaccinationists produced by the establishment among children of invidious distinctions between those who did and those who did not. Urging people to buy what they do

not know they want may make some of them at least refuse to get what they really need.

There is, nevertheless, an economic aspect to the preservation of health and to the practices designed to further health. Illness, aside from pain or suffering, means loss of time; it means reduced efficiency and poorer workmanship; it means burdening the budget with enforced payments for drugs, doctors, and hospitals, and incidental expenses that are seldom met with relish. Even without illness, lowered physical or mental tone, lowered endurance, flabby performance, and high fatigability are substantial handicaps in the economic life as well as in the enjoyment of life, regardless of competitive pressures. Moreover, there is substantial economy in the prevention of illness and in the maintenance of health, as against curing illness. There is economy in overhauling and anticipating, in prompt attention to irregularities that do appear, as against holding out until forced to quit. Such things people can understand and appreciate and act upon, even children, without demanding a premium for looking after their recognized interests.

A more subtle source of motivation in health education, and one that we have not used as extensively and fully as we might, is just the reverse of our common appeals. Instead of assuming that Old Devil Selfishness is the most powerful drive among the children of Adam, we might consider the fact that there is something inside these children that makes them gregarious, not to say social. They care enough about the companionship of others to make substantial sacrifices in the form of curbing impulses. They learn to count ten before striking, to bite their tongues, to wait for the cake to be passed instead of reaching over. In the same way they learn to bathe, to paint their cheeks, whether from the inside or from the outside, to dance and swim, to play tennis and skate, and to do dozens of other more or less artificial stunts for the sake of getting and holding the attention and esteem of their fellows; they discover, that is, that it pays to be healthy, it pays to observe the rules of health, on purely social grounds. Incidentally, too, the same rules have value in a specialized area of social adjustment, for the children of man are sexual as well as vegetative and social.

Still more subtle apparently, since it is so largely overlooked, is the fact that human beings really do care about others. Mothers, for example, do care about their children in the vast majority of cases—so much so that they have been known to sacrifice their own comfort, their own convenience, their own health, for the health of said children. That is, mothers are eager to keep their children well, or to make them

well in case of illness. They do indeed resist the teachings of doctors and nurses and dentists. They do misapply such health education as comes to them. They do neglect important details; but their hearts are still in the right place. It is not necessary to resort to special inducements to improve their technic. They will not do measurably better if we offer them a silver spoon with each bottle of cod liver oil, or a ticket to the movies with each recovery from whooping cough, or the privilege of seeing their names in the social column if they get rid of the mosquito breeding opportunities on their home premises, or of nits on their children's heads. The mothers, generally speaking, want to do what is suitable under the circumstances, for the sake of their children's health. The need is not so much for better motivation on their part as for suitable motivation on the part of doctors and nurses and teachers—motivation to get at the mentality and the prejudices and difficulties of the parents in question.

Similarly, I feel that we could accomplish more in health education if we recognized that young people care about others. There is a real appeal possible to the responsibility which each can be made to feel for the well-being of the community. Instead of saying to the young fellows, " Sleep nine hours and lick the Hoxey team," we might say, " See that the folks in your home, in your town, get a chance to sleep properly and make a happier home or town." That sounds rather cold, but there is something there we have not been using. Many of the young fellows, at least, would rather have a short life and a merry one; that is, they would rather continue to have a good time their own way than modify their program, sacrifice their good time, on the promise of having more time. I submit, in other words, that for healthy young folks health is no object. They are willing to sleep more if that will help the team, but they are equally willing to go without sleep if that will help anybody. They are ready to engage in most unwholesome occupations and risk their necks, just for the adventure; but they are equally willing to engage in such unwholesome occupations for the sake of other people's health—war for example, or epidemiology, or bacteriology.

Young women too can be interested in health matters quite as effectively by appealing to their desire to be of service as by appealing to their vanity, or the desire to stand higher in the history class, or in an athletic contest. The girl is often more eager to learn about suitable diet and regimen for her younger brothers and sisters than to improve her own practices for the furtherance of her own health. Health is no object; but the prevention of suffering on the part of others may well be. Moreover, there is not merely the sympathy and

considerateness of others that may be made effective in health education, but the growing sense of responsibility for the welfare of others, of the whole community.

Much of our effort fails to produce proportionate results because we assume too great a uniformity (1) as to human motivations; and (2) as to desirable objectives.

It is necessary to accept the fact of individual variation not merely in the physical traits that are measurable, but also in the interests, the concerns, and the desires of men and women. We must therefore take into account the dispositions and goals and purposes of people when making our attempts to influence them. We cannot proceed as though one set of motives could be generally relied upon to produce results. We have to differentiate our work according to age and sex, perhaps according to social and geographical areas, or to cultural background, according to occupational interest or place in the family. For young children it is sufficient to establish standard practice. The chief difficulty here is not that of making people accept our rules and doctrines; it is the fact that rules have to be changed with the increase of knowledge, whereas good indoctrination obstructs further learning. At one time protection against night air was sound teaching; or terminal disinfection; or the avoidance of water with meals, or of ice in water. For young and untrained people the solution is to be found probably not in confusing our teaching with excessive qualifications, but (a) in establishing practices with a minimum of preaching; and (b) in a continuity of guidance and reorientation.

With younger children and untrained adults, there will arise resistance to our efforts to modify habits, or overcome inertia, or inhibit impulses, thwart desires. Here we have to rationalize our recommendations as contributions to their health or well-being. With older children and with adults generally, our recommendations have to be rationalized as resting upon experience, or upon scientific research, or upon statistical generalizations. What good does it do a healthy person to get a medical examination? What good does it do a sick person to have his case recorded with the board of health? What good does it do a dead person to have the cause of his death reported? These questions cannot be answered in the terms assumed; health education has to recognize in each case that there are significant categories beyond the individual under consideration; and it has to proceed on the assumption that the individuals are both (a) able to appreciate these other categories, and (b) disposed to be concerned with them.

As to objectives, we know that we cannot promote health in the abstract. Although we look upon the organism as a unity, although

we think of health as somehow related to wholeness, our efforts are directed toward concrete and specific objectives—diet and air, sunlight and water, elimination and cleanliness, exercise and rest, and so on. We set up standards as to nutritive conditions, musculature, skills, controls, endurance. We then call upon each individual to come up and match himself against these abstract norms, or against selected models of perfection. Now this is essentially unwholesome. It calls for comparisons, and comparisons are odious because they are invidious. They invite people to take pride in the gratuitous gifts of the gods, which is humiliating to any self respecting individual; and they demand of people a mortification for things beyond their control, which must arouse the resentment of any self respecting individual. As those whom we urge thus to attempt the impossible become aware of the futility of aspiring to the 100 per cent score, they become indifferent or even hostile.

In many cases too the individual must resist all efforts to relieve him of his health handicap or disadvantage, for the handicap may be one of his chief assets. One's " abnormality " may serve as the principal source of attention and consideration, not merely for exploitation in the sideshow of the circus, but in the daily relation with others. Flat feet will save one from being the family fetch-and-carry. Susan is so nervous, she has to be spared at every turn. The weak heart, whatever that may mean, may be worth two strong ones. People will hug their defects, for these serve often as powerful weapons in their conflicts with the so-called " normal."

Since most individuals have various sorts of aberrations, in more or less serious degree, it may turn out that our health education can be more profitably based upon a program for attaining optimum general well-being than upon the hope of having all individuals attain the maximum. That means for the individual such help as we can muster toward adapting him to live with his troubles and deficiencies—with himself, in short, for people have to live with themselves even if they retire to the wilderness or take a trip around the world: mechanical appliances for a short leg, spectacles for refractive aberrations, insulin or specialized diet, a change of residence from seashore to mountain or *vice versa*, a change of occupation for some, perhaps even a change of religion or of the spouse. It means an education in the acceptance of the unavoidable and the irremediable, without repining, without self reproach, but also without supine submission to all ills, without futile misdirection of our protests and defiances. And, for all of us, it means increasingly an appeal to group consciousness and group responsibilities, as against an appeal to individual advantage.

Although it is always the individual who is sick or well, hygiene as a form of thought, as a technic, or as an effort toward health, is essentially social.

The educator is usually concerned with all the people rather than with this one or that. The individual starts out perhaps concerned only with himself; but through advancing maturity he sees his own health so intimately tied up with that of his fellows that he finds it more economical and more effective to concern himself increasingly with the community or social activities, content to share in the common gains. In so far, at any rate, as those engaged in health education and those exposed to it have common purposes, they will reënforce each other through their efforts. It is part of the technic of health education to recognize and to utilize the motivations of the public at large. It is part of the aim of health education to get more and more of the public—in schools, in homes, in industry, in government—to adopt the motivations of those engaged in health education.

Deaths from Silicosis in Great Britain

A MEMORANDUM recently published by the Home Office gives some interesting facts as to the prevalence of silicosis in Great Britain. The frequency of this disease during the last 3 years is shown in the following table:

Industry	*Number of cases*	*Deaths*
Ganister mines and silica brick works	80	30
Extraction and manipulation of sandstone	179	25
Pottery industry	322	87
Metal industry (including metal grinding and sandblasting)	81	32
Coal mines	91	20
Total	753	194

Investigations are being made by the Department of Scientific and Industrial Research into the efficiency of various types of respirators. Considerable progress has been made, and it is hoped that before long a respirator possessing the necessary properties will be produced.—*Ind. & Lab. Inform.*, XLIV, 1:23 (Oct. 3), 1932. E. R. H.

The Psychology of Public Education*

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MY proposal is that we need to face the problem of public intelligence in the same humble spirit in which the man of science faces other complex realms of natural fact. We need not make a mystery of the public mind. We need not overlook such solid information as we actually possess. But we do need to give up overconfidence. You who have the urgent and practical need to make widespread education effective in matters of health may feel that this plea for an attitude of honest ignorance is a council of despair, but I do not intend it as such. I mean merely to indicate my distrust in the rules and tricks of public appeal which you may obtain for the asking from many confident publicists.

Consider the course of events in the production of a modern motor car. The designer makes use of all available principles of engineering, but when the paper work is done, it is looked upon in the industry as merely a preliminary step. No manufacturer would think of putting that car into production simply because the design looked plausible. Almost every element in the complex machine is sent to the laboratory.

Those of you who are familiar with the slap-dash manner in which the average campaign of public education is put forth must be struck by the contrast between that method and the one followed by the manufacturer of motor cars. The automobile is based upon the most dependable of all the sciences—the science of physics—yet experience has shown that no amount of theoretic knowledge can circumvent the necessity of empirical test. Campaigns of public education, on the other hand, are based upon social psychology, the theory of which is faltering and the principles of which are vague. Should we not expect an even greater need for feeling our way by means of the most careful checks and experiments?

In 1925 I began to study the behavior of the museum visitor in the hope of showing museum curators that they could not expect, on the

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basis of theory alone, to reach their public in the most effective manner. Two years later I was approached by a museum director who asked me what kind of labels to use in the new building into which his institution was moving. There were a few direct suggestions which any psychologist could make under the circumstances, but my principal answer was that I could show him and his assistants how to test their own ideas of labelling by means of experiments. This proposal was received politely, but I was not requested to go further with the matter. This experience brought home to me the resistance to the experimental method that is to be expected whenever the problems to be dealt with involve human nature rather than the operation of machines. The more human the problem, the more impatient we are with the arduous exercise of the experimental method.

A short time ago the Psychological Corporation made a study of ideas that were being used in national advertising campaigns. Two thousand housewives were asked such questions as these: What refrigerator is *Dual Automatic?* What toothpaste advertises *Pink Toothbrush?* What company selling canned fruit advertises *Just the Center Slices?* What company advertises *I Smell Smoke?*

To quote from Dr. Henry C. Link: "The correct answers are as low as 20 per cent, 30 per cent, and 40 per cent of the total number of housewives asked in regard to certain campaigns, and as high as 50 per cent and even 75 per cent in other cases." When the amount spent in advertising was considered, one slogan was found to be 150 times as effective as another.

Now the astonishing fact is not that one slogan could be so much more effective than another, but that thousands of dollars were spent in propagating such slogans without any more serious effort to measure their efficiency than was represented by the armchair judgment of an advertising expert. Link's study was not carried out until the campaigns had actually been under way for months. Let us recall the automobile maker. Would he for a moment go ahead with production on a car if he had nothing better than an expert's surmise that it would work? If he did, we should have one motor car with 3 or 4 times the efficiency of another in the same price class.

The public museum offers an almost ideal example of the practical value of the experimental approach to the public mentality. If we make a possible exception of the technical study collections which are displayed for the benefit of scholar and connoisseur, we may properly say that the public museum is simply an intricate pattern of psychological stimuli. It functions only in so far as it has some actual influence upon the thoughts, feelings, and actions of its visitors. The

setting up of new displays, the development of lecture courses, the labelling of the exhibits: all these are merely preparatory steps. The museum is not effective until certain dynamic relations arise between its formal physical features and the public that flows through its corridors. Yet, until 1925 no serious effort was made to attain objective, reliable knowledge of what the public museum does to its visitors. Since then a large number of the basic problems of museum functioning have been at least touched by experimental and observational procedures.

Consider first the sheer size of the museum building. Do people act differently in large and small museums? Visitors have been picked up upon their entrance into the building and followed, without their knowledge, through the course of their visit. Each stop has been recorded as to location and length. The speed of travel early and late in the visit has been determined. From such results it has been possible to show that the large museum is large at a cost. A person confronted with 1,000 pictures shows in his behavior the competition for his attention. It might seem upon first thought that such a finding has only academic interest, because big museums are not likely to make voluntary reductions in size; but the big museum is constantly making decisions as to the size of its public displays. Some of the best administrative work in the museum field has consisted in setting aside for study purposes objects that had formerly distracted and consequently hurried the ordinary visitor.

Every museum gallery and corridor presents in its size and shape problems that only the observational method can solve. We have found that under ordinary circumstances—that is in relatively symmetrical buildings and rooms—there is a strong tendency for the public to bear to the right. This tendency has shown itself to be remarkably similar in different museums and even in different cities. About 75 per cent of the visitors bear to the right and about 25 per cent to the left. This finding becomes of the first importance if we wish to arrange paintings or cases in such a manner as to tell a continuous story. But before these results were obtained, there was a persistent tendency upon the part of curators to lay out exhibits in direct opposition to this habitual line of march. Working from blue prints the eyes have moved to the left and then around the building as they would read a line of print. But the visitors have continued to walk first to the right and then around to the left. One museum which I recently visited had screaming signs to force people to go first to the left in order to fall into the chronological order of the exhibits, but there would have been no reason to erect signs if the natural routes of

visitors had first been considered. There are many more findings obtainable regarding the influence of door position and of rooms of peculiar shape, but it is safe to say that if curators without the aid of controlled observations missed this distinction between right and left walls, they are equally in need of such observations to determine the attention values of less obvious locations.

Another purely formal problem involves the optimal use of a given amount of exhibition space. During the last few months intensive investigations of this problem have been carried on in the Buffalo Museum of Science and in the Pennsylvania Museum of Art. Earlier laboratory work had shown that the crowding of displays may play a more pronounced rôle in setting up so-called museum fatigue than do hard floors and poor ventilation. In both of the museums just mentioned it has been possible to demonstrate for a given picture gallery, or for a given case of scientific materials, definite limits beyond which the addition of objects or pictures brings about a marked decrease in interest in the gallery or case as a whole. We actually found it possible to increase the amount of time which visitors would spend at certain exhibition cases by removing some of the materials from the cases. Museum men once comforted themselves by saying that it was their duty simply to make available whatever objects of art, science, or history they might have at hand, and it was the duty of the public to select for study or enjoyment those objects that struck their fancy. These recent investigations show, however, that the multiplication of pictures or objects on display does not simply increase the range of choice for the visitor, but seems rather to increase the burden of making a choice.

Some of these studies of the museum visitor have touched upon the most fundamental conceptions of modern museum practice. In recent years there has been a great development of period rooms in the art museums of both Europe and America. In the main this has been a happy development and one which has undoubtedly increased the appeal of many a museum. But new ideas of all kinds have a way of creating new philosophies, and these philosophies are not always as sound as the ideas that have suggested them. The period room method won a number of adherents who decided that the period conception ought to dominate all art displays. Their argument was plausible. They said that lines of paintings hung on bare walls were depressing. These pictures were created for the decoration of furnished interiors and they should be viewed in the general setting appropriate to the artist's time. In other words, if furniture, rugs, hangings, clocks, bric-a-brac, pictures, and the rest could be gathered

into pleasing combinations, the naturalness of the whole scene would give the visitor a feeling of repose and increase his interest in the individual art object.

Now the method which I am urging upon you is inherently suspicious of just such convincing arguments as this. Because of the splendid sporting spirit of a museum director who, himself, is a fairly enthusiastic exponent of the period idea, it was possible to carry on experiments upon public interest to determine the influence of the setting of art objects. In the main we found that the individual object, such as a painting, fares somewhat better in the relatively abstract atmosphere of the gallery than it does in combination with period furniture. In other words, the hypothesis that the period room increases interest in the individual object because the monotony of a single type of object is broken, does not hold up under experimental scrutiny. The period room remains the best method of displaying the total art of interior decoration for a given period, but those plausible effects which it was supposed to have upon the visitor probably do not bear close examination.

Thus far I have spoken of the check which the empirical method is able to apply to current devices for dealing with public interest. But the ultimate uses of the method should go beyond the proof that present practice is or is not soundly based. It is feasible to make use of the experimental procedure at an early stage in the development of any program of public appeal. Let me cite, as an example, some recent studies of the label question in connection with paintings. Instead of taking labels already prepared by a curator unaware of the possibilities of experimental test, we decided to construct labels in such a way as to bring out the importance of the several elements in the labelmaker's technic. We distinguished the types of information that could be given in regard to a painting. The label might place the picture historically; it might say something of the technic of its production; it might explain the story; or it might attempt to explain the esthetic effect at which the painter was aiming. Having distinguished these several elements in label-making, we had labels written emphasizing some one of these elements or some combination of them. We then measured the influence of these several types of label, not upon label-reading, but upon interest in the painting itself. As a result we were able to secure labelling of a given picture which increased the interest in that picture by as much as 50 per cent. The best labels were not exactly what one would have guessed beforehand. The esthetic label, for example, had a high order of effectiveness, though many of us would have predicted a poor fate for it.

The experimental approach to the problem of public influence thus offers a constructive as well as a critical service. In one case, by developing labels through a process of experimentation, it was possible to increase the length of stay of the average visitor to the 69th Street Branch of the Pennsylvania Museum by 33 per cent. The experimentalist is far more pleased with such a finding than he is with the most dramatic debunking of traditional practices.

And now let me return from the special problems of the museum to the more general problems of public education. It has been my purpose to convince you that the public mentality is sensitive and complex. No list of motives or instincts to be found in the textbooks will give you accurate grounds for predicting the fate of a given appeal. Before experimental checks have been instituted, all we can have is a hunch. However certain we may feel that the public will be soothed by this slogan or excited by that, or that these simple facts will be readily understood by the masses, we should remember that we are evaluating our own feelings and capacities and not those of the public. The final test of a new type of carburetor is always applied when that carburetor is actually in operation on a motor car. The final test of any program of public education and appeal must wait until that program can be given an experimental circulation.

If widespread health education is to be continued on its present scale, it would pay you to set up, as the public museums have done, an experimental center where objective standards of educational efficiency can replace the hunch of the artist, the poet, and the advertising man.

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The Mental Hygiene Symposium

from the Washington Annual Meeting will be published in the March JOURNAL. *This includes papers by*

Ira S. Wile, M.D., *William A. White, M.D.,*
Esther Richards, M.D., *Clarence M. Hincks, M.D.,*
and Elizabeth Adamson, M.D.

Health Aspects of Fruit Beverages*

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RECENTLY I took occasion to run through some of the new texts on nutrition just to list aspects of fruits as a dietary essential that had merited attention by the various authors. Here are some of the values claimed:

TABLE I

1. Good for children to meet a natural craving for sweets, to satiate without danger of excess of sugar eating or calorie intake. Also good for adults for the same reasons with special reference to the matter of obesity.
2. Good as regulators of gastrointestinal function stressing:
   a. laxative effect or
   b. the contribution of vitamins A, B, C, and G.
   c. their influence on bacterial flora.
3. Good as preventive of acidosis, regulation of urinary acidity, building of alkali reserve, etc.
4. Good as sources of essential mineral elements, Ca, P, Fe, Cu, Mn, etc.
5. Exceptionally important antiscorbutics.
6. Important factors in the prevention of dental caries.
7. Important as giving palatability and flavor to diets without increasing unduly costs or calories.

These values alone would justify the significant place fruits and fruit beverages have gained in the estimation of the nutritional adviser and the research that is necessary to measure the contribution of specific fruits to the consumer; but I am not at all sure that the above list of values is complete.

During the past 5 years I have been interested in new phases of fruit contribution to nutrition, and as opinions and data on the above points are already available in texts and reprints, I felt it worthwhile to confine my presentation here to some of this experimental work as suggesting possible new values worth study and evaluation.

In 1925, Chaney and Blunt [1] reported that when 600–700 c.c. of orange juice was added to the diet of 10–11 year old girls, calcium retention was increased to a degree not explicable by the amount of calcium contributed by the juice itself. The suggestion was that in some way the juice actually increased the utilization of the calcium in other articles of diet consumed with the orange juice. If such function exists it is an addition to the list given above. It is also

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important to know whether this function is confined to orange juice or is shared by other fruit beverages and pulps. It is further important that we learn how the effect is accomplished.

For the past 7 years I have been experimenting with this hypothesis of Chaney and Blunt. I would like to trace certain aspects of this experimentation, its findings and its perplexities which must still be resolved. Also some collateral functions that have developed in the research.

At first my studies were largely confined to the banana. You may object to my citing this work as not germane to a fruit beverage "subject," but with the development of dehydrated banana (banana powder or sugar) this fruit offers possibilities of milk modification or other forms of beverage that put it in my field of report today. My earliest studies were conducted with the coöperation of Dr. Sidney V. Haas and aimed to duplicate those of Chaney and Blunt with the banana as the fruit instead of the orange. Table II summarizes this first experiment.

TABLE II

EXPERIMENT 1.

Subjects: 3 boys at the Hebrew Infant Hospital aged 3–4 years. Basal diet built on approximately 840 gm. cooked farina, 40 gm. butter, 540 gm. milk, 100 gm. bread, 42 gm. eggs, 2 gm. biscuit, and 180 gm. potatoes daily. Actual intakes measured by nurse daily. After a period on this diet a carmine capsule was given to mark the feces and after feeding the diet was continued but with two bananas daily replacing some of the carbohydrate of the previous diet so as to make calorie intakes practically the same. Feces and urines collected during both periods and analysed.

RESULTS

Child	*Period*	*Ave. Daily Intake Calcium Grams*	*Daily Output Grams*	*Amount Retained Grams*	*Per Cent Retained*	*Amount Absorbed Grams*	*Per Cent Absorbed*
"L"	Non-banana	0.7266	0.4476	0.2790	38	0.3017	41
	Banana	0.7412	0.4035	0.3377	46	0.3613	48
"F"	Non-banana	0.7914	0.4485	0.3456	43	0.4096	52
	Banana	0.7676	0.2991	0.4685	61	0.5134	67
"B"	Non-banana	0.7499	0.5480	0.2019	27	0.2938	39
	Banana	0.7747	0.6541	0.1306	17	0.2035	26

Child	*Period*	*Ave. Daily Intake Phosphorus Grams*	*Daily Output Grams*	*Amount Retained Grams*	*Per Cent Retained*	*Amount Absorbed Grams*	*Per Cent Absorbed*
"L"	Non-banana	1.4687	0.4846	0.9841	67	1.3506	72.7
	Banana	1.4007	0.5020	0.8987	64	1.2170	64.0
"F"	Non-banana	1.8258	0.4360	1.3898	76	1.7464	78.5
	Banana	1.5485	0.5343	1.0142	65	1.4268	71.3
"B"	Non-banana	1.8947	0.5296	1.3651	72	1.7896	76.6
	Banana	1.7207	0.6429	1.0778	62	1.5245	70.4

In Chaney and Blunt's work the orange juice increased retention of both calcium and phosphorus. In this series I got increased retention of calcium with 2 subjects but not with the 3d. I got no increase in retention of phosphorus with any of the children on banana. My diet was in general not optimal for Ca/P ratio, that ratio being 0.43 during the non-banana period and 0.49 during the banana period. However the contrast between the effect on phosphorus and on calcium gave partial support to the view that the banana had, like Chaney and Blunt's orange juice, brought about greater retention of calcium. Partial confirmation only, because 1 case failed to develop this difference.

Later I had, with Dr. Haas, the opportunity to repeat these observations in part in a study of infants divided into 2 groups, 1 group on milk modified with banana sugar and the other on milk modified with cane sugar. These results are shown in Table III together with some studies made by Brown and Courtney.[2]

TABLE III

EFFECT OF BANANA-MILK BEVERAGE ON CALCIUM ABSORPTION

	Diets	
Data	*Milk and Cane Sugar*	*Milk and Banana Sugar*
	Grams	*Grams*
Wt. feces dry	1.926	2.761
Ca intakes	0.9513	1.0846
Fecal calcium	0.1524	0.1198
Difference	0.7939	0.9648
Per cent Abs.	84%	89%
	Grams	*Grams*
P. intakes	0.7354	0.8937
Fecal P.	0.0345	0.0316
Difference	0.7009	0.8621
Per cent Abs.	95%	96%
Ca/P ratio diet	1.29	1.21

BROWN AND COURTNEY EXPERIMENT

(*Canad. M. J.* 21:37, 1929)

Data	*Banana Children*	*Controls*
Grams Ca intake	1.8	1.92
Per cent retained	18.4	19.9
Grams P. intake	1.86	1.90
Per cent retained	21.6	21.2
Grams Mg. intake	0.416	0.329
Per cent retained	23.6	21.9
Ca/P ratio diets	0.97	1.01

Again results are not completely confirmatory. The modified milk series showed in every case (about 10 infants on each diet) a better absorption of calcium with banana sugar than with cane sugar, but we did not measure actual retention in this series. On the contrary, Brown and Courtney with their diets (children 5 to 13 years of age on 3 to 5 bananas per day) failed to get increase of calcium retention but did get increase in magnesium retention.

These experiments, especially mine with children on mixed diets, lacked considerable of satisfaction as to accuracy of intake figures and did not permit of as rigorous control in various matters as was desirable. I therefore next set up a series of white rat studies where these matters could be better controlled. In this series I used 6

TABLE IV

EFFECT OF VARYING PROPORTIONS OF BANANA IN RAT DIETS ON RETENTION OF CALCIUM AND PHOSPHORUS AND OTHER DATA

Diets tested:
No. 1. 2/3 milk powder and 1/3 white wheat flour
No. 2. 2/3 milk powder and 1/3 banana powder
No. 3. 1/2 milk powder and 1/2 white wheat flour
No. 4. 1/2 milk powder and 1/2 banana powder
No. 5. 1/3 milk powder and 2/3 white wheat flour
No. 6. 1/3 milk powder and 2/3 banana powder

Data Obtained	*On Diet One*	*On Diet Two*	*On Diet Three*	*On Diet Four*	*On Diet Five*	*On Diet Six*
Ave. Ca intakes (grams)	0.1890	0.1847	0.1133	0.1216	0.1015	0.1469
Amt. absorbed (grams)	0.0920	0.0864	0.0527	0.0668	0.0547	0.0942
Per cent absorbed	49	47	54	55	54	64
Total output Ca (grams)	0.1085	0.1136	0.0689	0.0706	0.0544	0.0654
Per cent retained	43	39	39	42	47	57
Ave. (grams) P. intakes	0.0650	0.0633	0.0435	0.0439	0.0353	0.0440
Amt. absorbed	0.0277	0.0235	0.0192	0.0176	0.0153	0.0142
Per cent absorbed	43	37	44	40	43	32
Total output (grams) P.	0.0601	0.0609	0.0395	0.0417	0.0360	0.0462
Per cent retained	7	4	9	5	—2	—5
Ave. (grams) N. intakes	0.3962	0.3370	0.3223	0.2373	0.2938	0.2338
Amt. absorbed	0.3356	0.2610	0.2821	0.1682	0.2588	0.1210
Per cent absorbed	85	78	88	71	88	52
Total output (grams) N.	0.3595	0.3123	0.2991	0.2344	0.2263	0.2374
Per cent retained	9	7	7	1	23	—1.5
Dry wt. (grams) feces	0.8788	1.1950	0.6179	1.0806	0.4989	1.6994
Blood Ca/P ratio	17.9	20.8	21.9	23.3	21.2	19.3
pH Stomach	4.8	5.7	4.1	4.4	3.6	3.9
S. Intestine	6.1	6.4	6.5	6.5	6.5	6.5
L. Intestine	8.5	7.9	7.6	6.3	7.3	5.6

different diets and 3 rats on each diet. The character of the diets and the analytical data compiled are given in Table IV.

These studies were illuminating on several points. It was evident that the fruit produced a definite increase in volume and weight of fecal output and that with this increased output there was less retention of phosphorus and nitrogen, as would be expected, but that if the amount of fruit was sufficiently great in proportion to other factors in the diet there was, in spite of this increased fecal output, a markedly greater absorption and retention of calcium. It is true that in the banana diets given the actual intakes of calcium were slightly greater than in the control groups, but I do not believe of sufficient difference in amount to account for the way calcium behaved when contrasted with the behavior of nitrogen and phosphorus.

Of the other data noted we were especially interested in the values of the gastrointestinal tract for it might be that the explanation of increased calcium absorption lay in the effect of the banana sugar on the development of aciduric bacteria. Such a development would make a more acid intestine and hence tend to make the calcium compounds more soluble, more readily absorbed. The effect in the large intestine seemed to confirm this view. It was felt that this effect required more study and also that a more direct method of measuring absorption than by subtraction of fecal output from intake was desirable.

In pursuit of the first objective I took occasion in connection with the study of the infants on modified milk diets noted in Table III to collect the stools and have Gram-positive/Gram-negative ratios run on these stools. In general the ratios obtained confirmed the view that the banana tended to increase the Gram-positives. The ratios on the milk and cane sugar were of the following order of magnitude: 1/6; 1/40; 1/18; etc., while the ratios of the milk and banana sugar group was of the order of 1/1; 1/2.5; 1/0.7; 1/1.2; 1/0.9; etc., to quote some of the figures actually obtained. Furthermore, when we changed the diets of some of these infants, placing those that had been on milk and cane sugar on the banana mixture and *vice versa*, we accomplished in less than a week a reversal of the previous ratios.

Such ratios from stool smears are not too conclusive as characteristic of the conditions of the entire intestinal regions. At this point I therefore enlisted the coöperation of Dr. Lloyd Arnold of the University of Illinois Medical College. Dr. Arnold attempted to study the problem with the aid of white rats and suitable technics for accurate measurement of Gram-positive/Gram-negative ratios and pH values of segments of the rats' gastrointestinal canal. The diets

TABLE V

DR. LLOYD ARNOLD'S OBSERVATIONS ON THE EFFECT OF SUGARS ON INTESTINAL FLORA AND HYDROGEN ION CONCENTRATION

Rat Diets Used:

18% purified casein
8% butter fat
2% cod liver oil
4% Osborne and Mendel salt mixture

and 68% carbohydrate which was cornstarch, dehydrated banana, sucrose, lactose, or a mixture of lactose and banana powder.

Each animal received in addition to the above diet 3 per cent of dried yeast daily and one meal of cabbage and of carrots weekly.

Gram-Negative/Gram-Positive Ratios:

Carbohydrate Used	*Stom.*	*Duod.*	*Jej. 1*	*Jej. 2*	*Jej. 3*	*Ileum*	*Caecum*	*Rectum*
Sucrose (–12th week)	1:1	1:6	1:4	1:6	1:5	1:3.5	1:2.5	1:1.5
Cornstarch (4–5th week)	1:4	1:1.5	1:2	1:2	1:2.5	1:2.5	1.5:1	1:2
Banana (5–8th week)	1:8	1:6	1:10	1:8	1:6	1:5.1	1.5:1	1.5:1
Banana plus lactose	1:16	1:12	1:22	1:21	1:11	1:14	1:19	1:18
Nursing rats (lactose)	1:30	1:31	1:35	1:30	1:44	1:44	1:8	1:6

pH of Gastrointestinal Segments:

Carbohydrate Used	*Stom.*	*Duod.*	*Jej. 1*	*Jej. 2*	*Jej. 3*	*Ileum*	*Caecum*	*Rectum*
Sucrose	2.5	6.2	6.4	6.4	6.6	6.9	6.7	5.6
Cornstarch	2.7	6.3	6.4	6.4	6.3	6.5	6.5	6.5
Banana	2.6	6.3	6.4	6.4	6.4	6.8	6.6	6.6
Banana plus lactose	2.6	6.1	6.1	6.2	6.3	6.6	5.8	5.9
Nursing rats (lactose)	2.8	6.2	6.4	6.4	6.4	6.9	6.5	6.4

he used, the regions studied, and the results obtained, are given in Table V.

These results partially confirm the theory that the banana sugar increases the acidic condition of the intestine. It did produce a greater proportion of Gram-positives than of Gram-negatives, but was not as potent for this purpose as lactose. The effect on the pH of the tract was not so evident in this series. Dr. Arnold, however, studied further the condition of the Gram-positive and Gram-negative organisms in each series. He made a most interesting discovery; namely, that the viability of the organisms in the different carbohydrate series showed marked differences—in general, that the banana sugar markedly reduced viability in the coli types. The data on this point are given in Table VI. This was a quite new property of the

TABLE VI

DR. ARNOLD'S DATA ON THE VIABILITY OF COLI ON DIFFERENT CARBOHYDRATES

	Small Intestine		*Large Intestine*	
Diet	*Stainable*	*Viable*	*Stainable*	*Viable*
Cornstarch	10	1	10	10
Sucrose	10	2	10	10
Banana	10	0	10	2
Lactose	10	1	10	5
Nursing	10	0	10	5

fruit and immediately suggested that it might be of significance in explaining the effect of banana in the treatment of celiac disease, pyloric spasm, sprue, and other cases of intestinal disturbance which had been shown empirically to respond to treatment with this particular fruit.[3,4,5,6] To test this point out Dr. Arnold initiated a new series of studies to determine the effect of banana powder on *B. enteritidis*.

The result of the first series is given in Table VII. If these results

TABLE VII

THE EFFECT OF BANANA SUGAR ON B. ENTERITIDIS

(Preliminary Report by Dr. Lloyd Arnold)

Using rat diets already described in Table V, 18 rats on each of the cornstarch and banana combination were used in this series.

Series L. After feeding the rats 4 weeks on the diets 9 in each set were fed *B. enteritidis* by stomach tube with the following results:

Time Elapsed	*Cornstarch Series*	*Banana Series*
After 24 hours	*B. enteritidis* in the feces	*B. enteritidis* in the feces
After 48 hours	*B. enteritidis* in the feces	*B. enteritidis* in the feces
After 3–8 days	*B. enteritidis* in the feces	Feces negative
After 9–12 days	Rats had diarrhea; fur was rough; animals prostrated. *B. enteritidis* in feces in practically pure culture. 2 deaths, 1 on 10th day and 1 on 11th	Animals in good condition Feces negative
After 13 days	Survivors recovering	All normal
After 14 days	Survivors normal	All normal
After 5 weeks	*B. enteritidis* isolated from small intestine of 5 out of 6 rats. 5 had *B. enteritidis* in spleen. 2 had *B. enteritidis* in mesenteric lymph nodes. 1 had *B. enteritidis* in liver and 1 had it in heart blood	No *B. enteritidis* recoverable from any segment of the gastro-intestinal tract. Spleen, liver, kidney, mesenteric lymph gland and heart blood sterile.

Series B. 6 rats on banana and basal; 6 on cornstarch and basal; and 6 on cracked corn only.

1. *B. enteritidis* added to drinking water for one day.

Results:

Cracked corn series:	diarrhea feces pract. pure culture on 7th day. Fur soiled and rats prostrated
Cornstarch series:	2 sick on 5th to 7th days and then recovered
Banana series:	no disturbance, normal weight gains

2. *B. enteritidis* given intraperitoneally.

Results:

Cracked corn series:	6 rats died in 48 hrs.
Cornstarch series:	2 died in 24 hrs. 2 diarrhea with recovery
Banana series:	no visible effect on the rats

are confirmed by further studies, we have evidence of an entirely new rôle of the fruit, viz., the actual destruction of activity in *B. enteritidis* and perhaps a new use for the fruit in the handling of intestinal disturbances of colon bacillus origin.

TABLE VIII

THE EFFECT OF FRUIT JUICES ON THE RATE OF ABSORPTION OF CALCIUM SALTS

Experiment 1. The relative rate of absorption of $CaCl_2$; Ca lactate; and Ca gluconate in water solution.

Salts	*Per cent absorption in*					
	30	60	90	120	150	180 minutes
Calcium chloride	29	42	46	62	71	66
Calcium lactate	10	30	42	41	50	60
Calcium gluconate	20	21	21	25	25	27*

* Calcium gluconate found mainly in the large intestine after the first 30 minutes.

Experiment 2. Effect of medium of solution on $CaCl_2$ absorption rate.

Solutions	*Per cent absorption in*		
	30	60	90 minutes
Calcium chloride in water	16	20	31
Calcium chloride in grape juice	30	44	44
Calcium chloride in orange juice	3	44	63
Calcium chloride in tomato juice	22	48	

Experiment 3. Repetition of Experiment 2 on grape juice.

Per cent absorption in 30 minutes		*Per cent absorption in 60 minutes*	
Calcium chloride in water	*Calcium chloride in grape juice*	*Calcium chloride in water*	*Calcium chloride in grape juice*
30.35	4.81	41.07	70.57
27.28	10.00	46.41	65.38
32.14	10.00	64.28	64.42
28.57	16.92		70.57
	16.93		72.30
	12.59		68.84
	25.59		79.20
	13.46		65.38
	11.73		61.99
			65.38
Ave. 29.51	13.56	Ave. 50.59	68.40

While these studies were progressing in Chicago, I turned my own laboratory's attention to direct measurement of absorption of calcium in the presence of different fruit juices. For this purpose I modified the method of Cori.[7] This consisted of feeding rats by stomach tube a measured quantity of the substance whose absorbability was to be determined (sugar in Cori's experiments) after a 48-hour period of fasting; then killing the rats at intervals of time selected, recovering the alimentary tract contents and analyzing to determine the amount

of the fed product still present. We found by studies of starved rats that a certain residuum of calcium remains in the tract even after 48 hours' fasting. This amount was found to be fairly constant for rats of similar dietary history and could be used for correcting the analytical recoveries. We have to date made use of this method to study the rate of absorption of calcium salts such as chloride, lactate and gluconate in water solution and also of the effect of solution in orange juice, tomato juice, and grape juice. Table VIII shows some typical results.

These results in general give further support to the suggestion of Chaney and Blunt, in 1925, that fruit juices may have a supplementing effect in making more utilizable other factors in food mixtures. The mechanism by which the effect is accomplished is not demonstrated by our experiments to date but several leads have been suggested and are being followed.

I have presented these experiments to call attention to the fact that we have not yet exhausted the health contributions of common fruit juices and pulps, and to suggest the desirability of further search in this field. I believe that the clinical experience with fruits in certain pathological cases, if collated and analyzed, would still further extend the list of values contributed by these forms of protective foods. I have records of sprue cases where fruit carbohydrate was handled and cereal form not tolerated. Such clinical data stimulate curiosity as to the etiological factors involved, to a comparison of fruits to see in which the property is inherent, and in which it is lacking and why. Such knowledge is a means to better preservation of health and of better selection of foods to that end.

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USE YOUR PUBLIC HEALTH DEGREES

VARIOUS college degrees in public health have now been awarded to more than a thousand persons, most of whom are regularly engaged in professional health activities. As time goes on many additional degrees will be granted, so that in the future there will be a large body of specially trained sanitarians whose professional attainments will be indicated by these public health degrees.

In order that the general public may become familiar with the fact that public health is a distinct profession and requires special instruction, individuals who are fortunate enough to possess professional degrees in this subject should make a practice of using them constantly. Thus, the physician who is also a doctor of public health should write himself not merely, " John Smith, M.D.," but should put his name as "John Smith, M.D., Dr.P.H." So too, the nonmedical sanitarian who has his doctorate or certificate in public health should never hesitate to employ it as an appendage to his name when used in a professional capacity. Letterheads, professional cards, and other materials employed in connection with public health duties should always display these scientific degrees, as should articles and reports.

Those persons who have the well known degrees such as the " Ph.D." or " Sc.D." might likewise, if they have been granted in public health, write after their names, " Sc.D. (Hygiene)" or some similar indication of their professional training. The result will be that the public, by acquiring a proper appreciation of these doctorates

in the sciences of public health, will gradually come to demand that the sanitarian of the future must be a trained scientist, and that all guardians of the public health must be appointed primarily from among those who possess the necessary qualifications. Public health degrees should, therefore, be displayed wherever and whenever possible.

ONLY THREE CENTS FOR HEALTH

ONE of the most striking charts in the recent final report of the Committee on the Costs of Medical Care* shows how "Our Medical Dollar" is spent. Out of a total bill of $3,656,000,000 for 1929, only 3.3 cents in every dollar is spent for public health, $121,000,000, to be exact. On the other hand, we spend 3.4 cents or $193,000,000 on cults and quacks and 18.2 cents or $665,000,000 on drugs of which $360,000,000 is for patent medicines, for the most part worthless medication. Physicians (29.8 cents), hospitals (23.4 cents), dentists (12.2 cents), nurses (5.5 cents), and unclassified (4.2 cents), make up the remainder of the "medical dollar."

The American Public Health Association, from exhaustive study of the subject, lays down a standard of $2.50 per capita for public health in urban centers, and a somewhat larger expenditure in rural communities. On this basis the public health expenditures of this country should equal at least $300,000,000, or approximately 10 cents of the "medical dollar."

How shall we ever attain a goal of reasonable public health provision for all of our American citizens? The answer, based on the experience of the past two decades, is clear. Education, organization, and demonstration are three words that tell the story of the past and give an answer to the question of the future.

For two and a half decades the public health associations and allied groups of this country, in a nonofficial capacity and with meager resources, have been organizing, educating, and demonstrating in every part of the United States that "public health is purchasable." Cities, counties, states have been organized. Tuberculosis, venereal disease, child health, and several other special problems have been stressed. Public funds have been sought and secured for institutions, nurses, clinics, health departments, and other public health agencies. For every dollar expended by the private associations in promoting public opinion, the city, county, and state treasuries of the country have expended $10, $20, $50, and in many instances $1,000 or more.

* *Medical Care for the American People.* 1932. 214 pp., $1.50.

The American public needs the constant stimulus of some group or groups to keep up interest in any subject of common interest, even one so vital as that of the public health. That 3.3 cents offers a challenge to all who are engaged in public health work to let their friends and their constituencies know that at least three times as much effort is demanded, if we are to reach the desired goal of $2.50 per capita.

LETTER FROM GREAT BRITAIN

AN OUTBREAK OF ENTERIC FEVER

IN recent years outbreaks of enteric fever have been so rare that when in any particular neighborhood anything resembling a large grouping of cases occurs, it is not surprising that people become alarmed. In the case of the epidemic during the autumn months in and around the small town of Malton in Yorkshire, this was sufficient to cause a certain amount of disorganization in a variety of directions, and to arouse among mothers of families a degree of fear sufficient to lead them to determine not to send their children to school.

Incidentally also, it rendered necessary a visit to the area of the outbreak by the Chief Medical Officer of the Ministry of Health (Sir George Newman) and, following that visit, the issue of a special statement by the Ministry. In this it is shown that between September 23, when the first case was admitted to the local hospital on a diagnosis of "pneumonia and diarrhea," and November 17, 243 cases with 14 deaths had been notified.

The infection in the majority of instances is shown to have been waterborne, and to have reached the water supply from the first case by way of the drain of the hospital, later found to be seriously defective near its junction with the sewer. For some time, it appears, the bulk of the drainage, instead of entering the sewer, had been deposited for an extended period, according to the statement, "subterraneously upon land immediately contiguous both to the low-lying water well and to the pumping station (by which the well water was conveyed to the reservoir)."

The dates given in the Ministry statement are extremely important, and show that the period elapsing between the admission of the first case to hospital and the beginning of the flood of notifications was almost exactly a month. It shows also that comparatively only a very short time elapsed before those in charge of the investigation were able to put their finger upon the source of infection, and to adopt precautions designed to bring the epidemic to an end.

The steps taken included the giving of attention to the drainage system, chlorination of the water supply, and protective inoculation of members of the public. Also, "the future of the water supply is under consideration both from the medical and from the engineering points of view."

REPORT OF THE SENIOR MEDICAL INSPECTOR OF FACTORIES

MEDICAL inspection of factories in this country forms no part of the duty of the health authorities, and is in the hands of the Factory Department of the Home Office. For any

account of the work done it is necessary, therefore, to turn to the report of the Chief Inspector of Factories and Workshops to the Secretary of State for the Home Department, and not to that of the Chief Medical Officer of the Ministry of Health.

The report of Dr. John C. Bridge, the Senior Medical Inspector of Factories, and successor to Sir Thomas Legge, to whose death I referred some months ago, is invariably, so far as health officers are concerned, the most important part of the Factory Report. Of that for 1931, even though it has been distinctly curtailed, this may be said. The curtailing is, of course, the result of the general conditions, and this also is responsible for a reduction in numbers in various directions.

Notifications of industrial diseases—lead poisoning, anthrax, etc.—for example, are generally the lowest for some years, and though there may be some actual improvement, it is undoubted that in great part the low incidence is a reflection of the state of the labor market. In the case of lead poisoning, which returns 168 cases as against 265 for 1930, both factors appear to have operated, Dr. Bridge's conviction being that there is today much better protection from the risk attendant upon the use of lead. Of the industries, that in which the most striking improvement has occurred is pottery, 9 cases only as against 23 having been notified. Anthrax notifications, which number 21, were only half the number for 1930 (43), and notifications of epitheliomatous ulceration (65 as against 95) were also distinctly lower.

Aniline poisoning cases, on the other hand, showed an increase from 24 to 30, and toxic jaundice, of which there had been no cases in 1930, provided 7, due to arseniuretted hydrogen, in 1931. The most frequent cause of aniline poisoning, according to the report, is absorption through the skin, and the essentials in prevention are better protective clothing and prompt action in the case of emergencies, e.g., the result of splashing.

The great bulk of notified cases of chrome ulceration occurred among persons engaged in chrome plating, but as regulations for the processes are now in force it is probable that a reduction in numbers will occur. A number of instances are quoted in the report to show the seriousness of the risk from chromic acid in fume or liquid form. Epitheliomatous ulceration, as always, found mineral oil the commonest causative agent, more particularly in cotton mule spinning. Special attention is directed to the risks of cancer of the bladder among chemical workers employed for any length of time in the manufacture of synthetic dyes.

Very special reference is made to the subject of dermatitis, and it is shown that despite the use of preventives, as alkaline antiseptic washes in the case of oils, and ointments where chromic acid and its salts are concerned, the condition is still very common. Among causative agents, alkalies, specially soda and lime, are still the chief, with sugar, oil and dyes some distance behind. Dust and fumes and gases come in for detailed reference, silicosis and asbestosis receiving special mention under the former head, and under the latter cases of acetone poisoning.

Discussing industrial illnesses generally, Dr. Bridge draws attention to a fact very commonly lost sight of—that while there may be a relation between industry and ill-health, manual work undoubtedly does exercise definitely beneficial effects on mind and body. To an extent what happens so far as this is concerned depends upon whether or not the individual is interested in his task, and as Dr. Bridge puts it: "The uninterested worker is an industrial invalid. Interest in work leads to industrial good health."

THE FATHER OF THE ENGLISH HEALTH SERVICE

BY the death of Professor A. Bostock Hill, formerly Medical Officer of Health of the County of Warwick, and for long known as the "father of the public health service," that service has suffered a severe blow. Though he retired from office many years ago, he kept up his association with and interest in public health and preventive medicine, and despite his advanced age (he was 78 at the time of his death), up to within a few weeks of the end he had attended meetings of the Royal Sanitary Institute and other bodies with which he was connected, and which relied to an extraordinary extent upon him for wise advice and guidance. He was a clear thinker, a fine debator, and had wonderfully sound judgment. Among his other activities he had been Professor of Public Health in the University of Birmingham, and was held in great affection and esteem by many others than the large numbers occupying positions of importance who proudly claimed him as their teacher.

HEALTH WORK IN LONDON

THERE are many Londons on both sides of the Atlantic, but only one, I think, that has a population of 4,363,800 and is regarded as one of the world capital cities. For these reasons such facts as are published in the annual report on public health of Sir Frederick Menzies, the County Medical Officer of Health, are of something more than mere local interest. The population mentioned is that estimated to the middle of 1931. Actually, as revealed at the census, the population of London is falling, due mainly to movement of Londoners to districts outside the metropolitan area. The birth rate, of course, is falling, that of 1931—15.0 per 1,000—being the lowest on record.

In 1931, deaths were more numerous than in the previous year, almost entirely due to influenza, and respiratory and heart diseases associated with influenza. Special note is made of the tendency shown to a decrease in deaths due to street accidents. In relation to infectious diseases, the occurrence of decreases in certain cases is also noted. Smallpox—mild type—notifications, for example, fell from 5,149 to 1,452. Of actual cases of infantile paralysis, 51 were notified. The deaths numbered 6.

The 1931–1932 measles epidemic was less severe than that of 1929–1930. The deaths in 1931 numbered 115 as compared with 1,027 in 1930. In diphtheria notifications there was a marked reduction also, from 13,411 in 1930 to 8,384 in 1931. Notifications of fevers of the enteric group were 186 as against 291 in 1930. There were 24 deaths, the lowest number ever recorded in London from this cause.

Influenza was prevalent, the deaths numbering 1,121, the figure for 1930 being 366. The epidemic continued into 1932, the deaths in the second week in that year totalling 145. Rheumatic fever deaths were fewer, while those from cancer continued to show an increase: from 6,908 in 1930 to 7,159 in 1931.

The position in relation to tuberculosis in the metropolis is very fully examined in the report. The number of primary notifications (7,732) is down, and the death rate both from the pulmonary form (0.90 per 1,000) and the non-pulmonary (0.13 per 1,000) continues to decline. At the end of 1931 the number of cases of pulmonary tuberculosis on the registers was 29,565 (16,795 males and 12,770 females), and of other forms 11,060 (5,759 males and 5,301 females). Special note is made of the increased mortality from pulmonary tuberculosis among young women. This subject was one of those discussed at the Annual Conference on Tuberculosis this year, to which, I believe, I have already

made reference. The total number of cases receiving institutional treatment was 4,872, 3,218 passing direct to sanatoria or hospitals, and 1,654 to "observation" beds. The results of treatment are analyzed carefully and exhaustively, and appear to be satisfactory. Note is made of the fact that provision is made for London cases at Papworth Village Settlement.

There is reference also to a scheme, which apparently works well, under which a certain number of tuberculous youths receive special training in gardening with a view to their subsequent employment in the parks department. The scheme is working well, the boys so far selected giving satisfaction and benefiting greatly.

The report contains much most valuable information with regard to work done under the venereal disease scheme also, and in relation to blind persons, mental defectives, etc., all showing the vast extent of the ground covered and the thoroughness with which the various health activities of the county council are carried out.

CHARLES PORTER, M.D.

London

ASSOCIATION NEWS

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Ellis K. Devitt, M.D., Old Lyme, Conn., Health Officer

Clarence E. Lewis, M.D., Madison, W. Va., Boone County Health Officer

John H. McLaughlin, M.D., 37 Main St., Jewett City, Conn., Health Officer

William A. Meyers, M.D., 409 W. Main, Norman, Okla., Physician, State Bureau of Maternity and Infancy

William A. Powell, M.D., Box K, Martinez, Calif., Health Officer, Contra Costa County

Gradie R. Rowntree, M.D., Columbia, Ky., County Health Officer, Adair County

Cyrus J. Shelton, R. F. D. No. 2, Seymour, Conn., Health Officer of Oxford

Deering G. Smith, M.D., 77 Main St., Nashua, N. H., Chairman, Board of Health

Charles A. Wathen, M.D., McKee, Ky., County Health Officer

Laboratory Section

John R. Fitzgerald, 429 N. Main Ave., Scranton, Pa., Laboratory Director, Woodlawn Dairy Co., Chairman, Family Welfare Case Committee

Arnold J. Gelarie, M.D., 52 W. 74 St., New York, N. Y. (Assoc.)

Vital Statistics Section

G. Arthur Blakeslee, 3919 John R., Detroit, Mich., Director, Bureau of Vital Statistics, State Department of Health

Public Health Engineering Section

Jose Luis Escario, Duque de Liria 6, Madrid, Spain, Chief Engineer, Sewage Treatment Plant of Madrid (Assoc.)

Henry L. Morency, M.D.V., Temple Bldg., Boulder, Colo., City Health Officer

Cesar M. Opisso, Gerona, 18 Barcelona, Spain, Consulting Engineer of Sanitary Works (Assoc.)

Clarence S. Timanus, 406 Interstate Bldg., Kansas City, Mo., Consulting Sanitary Engineer

Charles T. Wright, B.S., U.S.P.H.S., Cincinnati, O., Sanitary Engineer

Food and Nutrition Section

Bernice Wait, Ph.D., Department of Home Economics, Experiment Station, Amherst, Mass., Research Worker in Nutrition

Child Hygiene Section

Paul S. Barrett, M.D., Department of Health, San Francisco, Calif., Director, Bureau of Child Hygiene

Ella Oppenheimer, M.D., Children's Bureau, U. S. Dept. of Labor, Washington, D. C., Specialist in Child Hygiene

Public Health Nursing Section

Helen L. Felkner, R.N., Ostrander, O., Field Representative, State Department of Health

Inez Gilliland, R.N., 27 Berkley Place, Columbus, O., Field Representative, State Dept. of Health

Harriet B. Luce, R.N., 11-D W. Weber Road, Columbus, O., Field Representative, Bureau of Local Health Administration

Olive B. Sheldon, R.N., 1222 Washtenaw Ave., Ann Arbor, Mich., formerly Teaching Supervisor, Out-Patient Dept., Battle Creek Sanitarium

Public Health Education Section

Norman L. Burnette, 180 Wellington St., Ottawa, Ont., Canada, Charge, Welfare Division, Metropolitan Life Insurance Company

Katharine R. Dutting, R.N., 70 Dubois St., Newburgh, N. Y., Executive Secretary, Newburgh Public Health and Tuberculosis Association

Jane S. Kennedy, R.N., 222 E. Pittsburgh St., Greensburg, Pa., Executive Secretary, Westmoreland Public Health Association

A. B. Kuhl, Jr., M.D., Board of Health, Davenport, Ia., Director

Hugh R. Leavell, M.D., 1022 Heyburn Bldg., Louisville, Ky., College Physician, University of Louisville

Epidemiology Section

Dr. George A. Sloan, 323 Narberth Ave., Narberth, Pa., President, Board of Health

Daniel M. Vail, 257 Suydam St., New Brunswick, N. J., Municipal and Sanitary Engineer

Unaffiliated

John A. Kienle, Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y., Engineer

Viola Weslock, 948 Greene Ave., Brooklyn, N. Y. (Assoc.)

DECEASED MEMBERS

W. D. Beacham, M.D., Hattiesburg Miss., Elected Member 1919

Menno Hostetler, M.D., Wichita, Kans., Elected Member 1930

Samuel Iglick, M.D., Orland, Calif., Elected Member 1931

Emma S. Lake, Greensburg, Pa., Elected Member 1924

John E. Monger, M.D., Columbus, O., Elected Member 1923, Fellow 1926, Honorary Fellow 1932

Morris Knowles, Pittsburgh, Pa., Elected Member 1901, Fellow 1923

YEAR BOOK

The Year Book for 1932–1933 will not be published as a separate volume, but will be included as a supplement to an early issue of the JOURNAL, thereby being made available to every member or subscriber without extra cost.

SOUTHERN BRANCH ORGANIZED

AT the initial meeting of the Southern Branch A.P.H.A. in Birmingham, Ala., November 14–16, a Constitution and By-laws were adopted and officers elected as follows:

President—E. L. Bishop, M.D., Nashville, Tenn.

First Vice-President—J. H. Mason Knox, M.D., Baltimore, Md.

Second Vice-President—J. D. Dowling, M.D. Birmingham, Ala.

Third Vice-President—Margaret L. East, R.N., Louisville, Ky.

Secretary-Treasurer—R. H. White, Ph.D., Nashville, Tenn.

Acting Secretary—Dorothy C. Cunningham.

Representative on Governing Council—F. J. Underwood, M.D., Jackson, Miss.

Although active membership in the Southern Branch is limited to full-time health workers who are members of the A.P.H.A., provision will be made for an affiliated membership class, composed of part-time health workers.

Dr. Kendall Emerson, Acting Executive Secretary of the A.P.H.A., at this meeting, welcomed the Southern Branch to affiliation with the parent organization, and expressed the belief that the solidarity that would develop among public health workers in the south as a result of this organization, would have a strengthening influence for the A.P.H.A.

PUBLIC HEALTH ADMINISTRATION

EARLY DIAGNOSIS OF TUBERCULOSIS AMONG CHILDREN

ELTON G. LITTELL, M.D.

Medical Director, Board of Education, Yonkers, N. Y.

THE campaign of tuberculin testing, with X-ray examination of the reactors, has been of value in what it has disclosed, and also as an example of community coöperation. A more satisfactory coördination of the activities of so large a number of individuals and of groups is difficult to imagine.

The Academy of Medicine gave its endorsement of the project, then held two meetings devoted to the subject of childhood tuberculosis, having specialists as speakers and parents, school teachers, and other lay persons as its guests. It later donated $150 for completing the taking of the X-ray films.

The Board of Education gave its approval of the work; the principals, teachers, nurses, supervisor of nutrition, registrars, students, and school physicians administered and carried out the many details of the project.

The Department of Health supplied the tuberculin; the Yonkers Tuberculosis and Health Association conducted a splendid educational work and financed most of the X-rays; two of the hospitals reduced materially the cost of the X-ray films and donated the services of the directors of the X-ray departments in taking and reading the films; the newspapers and radio station WCOH also aided in laying a foundation for this work. This foundation was in the process of building for over a year before the actual testing was begun—a community educational program being essential to the success of an undertaking of this nature. Letters of information were then sent to the parents by the principals with details of the testing program and included a form to be signed by the parents requesting the test, and X-ray if necessary, and giving authority to report the findings to the family physician.

After the tests, parents were notified of the results, whether positive or negative, with suggestions for the future to those who did not react to the tests and with X-ray appointments for those who did react. The parents were notified too of the X-ray findings. If the X-rays were negative, parents were urged to have other X-rays taken at appropriate intervals. With positive X-rays, the patients were urged to keep in touch with the family physician, who was also notified of the X-ray diagnosis, at what hospital the film might be seen,

TUBERCULIN SKIN TESTS

	Hawthorne Junior		*Roosevelt Senior*	
Number made		436		501
Negative		320		326
Positive Skin Reactions				
1st degree	101		140	
2nd degree	11		32	
3rd degree	4		3	
		116		175
Ages of Positive Skin Reactors				
11 to 12 years		7		..
12 to 14 years		65		50
15 to 16 years		41		100
17 to 20 years		3		25
Per cent positive		26.6		34.9

X-RAYS OF THE CHEST

	Hawthorne Junior	*Roosevelt Senior*
Number taken	113	174
Signs of tuberculosis	19	14
Per cent of positive X-rays of those showing reactions	.16	.08
Details of X-rays		
Tracheo - bronchial lymph nodes	12	6
Root tuberculosis	3	6
Primary nodules in lungs	4	2

FAMILY HISTORIES OF THOSE HAVING POSITIVE X-RAYS OF THE LUNGS

	Hawthorne Junior	*Roosevelt Senior*
Families with history of tuberculosis	7	8
Known cases of tuberculosis in these families	11	10
Known deaths from tuberculosis in these families	7	7

and that the patient was referred back to him for his care.

Old tuberculin, 1:1,000 solution, 1/10 c.c. was used.

No reaction other than the local skin reactions was discovered in any of the 937 tests.

SUMMARY

Of the families of the 33 pupils with positive X-rays of the chest, 15 (45 per cent) gave a family history of active lung tuberculosis. In the 15 families who gave a history of tuberculosis, there were 21 known cases of tuberculosis of the lungs and 14 known deaths from lung tuberculosis.

CONCLUSIONS

The demonstration suggests:

1. That a smaller number of skin reactors is found among the younger pupils who have lived fewer years and so have had fewer contacts with tuberculous patients.

2. That although the skin reactors among the younger pupils are fewer in number, a larger percentage of X-rays among them was positive—suggesting that earlier infection is more apt to appear in the chest. This may be influenced, however, by the fact that the neighborhood of the junior high school has had a much larger number of deaths from tuberculosis each year than the neighborhood of the senior high school.

The demonstration proves:

That the X-ray is a discoverer of otherwise hidden tuberculosis; that the tuberculin test is an inexpensive method of discovering those who ought to have the X-ray films; and that it would be wise to test all children, especially those of the high school age and those who are known to be in contact with cases of tuberculosis.

HEALTH DEPARTMENT REPORTS

Tennessee—One of the most comprehensive health department reports published in 1932 is that of the State Department of Health of Tennessee for the period 1929–1931. In general, mortality records indicate that the state suffered relatively more from infectious diseases and less from organic diseases of old age than the United States as a whole. The tuberculosis death rate at the end of the biennium was only three-fifths as high as that of 12 years ago; in 1929, the rate was 120 per 100,000 population.

Syphilis, if its effects could be accurately measured, might compete with tuberculosis as a cause of sickness and death. Actually, it disguises itself in so many ways, and contributes to the development of so many different symptoms or diseases, that the mere statistics of deaths attributed directly to syphilis give no idea of its prevalence and importance. Recent examinations of a large number of persons confirmed the common impression that syphilitic infection is particularly widespread in the negro population.

The basic objective of the state department is to bring the whole population under effective full-time local health service and to provide in the central organization only such services and facilities as local health departments cannot provide for themselves. In addition, the department attempts to equalize the opportunity for local health service as between the several sections of the state,

> . . . for in no other public activity is the interdependence of all sections so absolutely complete. Not only does one citizen deserve as much protection as another, but disease recognizes no political boundaries.

A small, compact, well trained central staff has been recruited and developed in order that expert service can be made available to any and all local departments. The state department consists of central administration and four divisions: Vital Statistics, Sanitary Engineering, Preventable Diseases, and Laboratories. Nearly 85 per cent of the appropriation goes either for state aid of all classes or for professional services.

More than half the rural population of the state is under the protection of full-time local health work. By the end of last year, 70,500 homes had been equipped with sanitary methods for the disposal of body wastes, and 526,000 children were given medical inspection in school hygiene work. Physical defects corrected rose from 18,000 in 1925–1926 to 49,800 in 1929–1930. During the year, 53,233 immunizations were given for diphtheria, 53,121 for smallpox, and 168,208 for typhoid fever.

Los Angeles County, Calif.—The annual report of over 200 pages, mimeographed, is made attractive by an ingenious cover design, instructive charts and tables, with descriptive text. Expenditures for the year ending June 30, 1932, were 10.5 per cent less than the previous year, although the economic depression resulted in an increase in case loads of the health center clinics. There was no epidemic of serious nature. The Health Officer estimates that public health activity in the county since 1920 has, through reduced cases and deaths, saved a financial outlay of $45,000,000. Diphtheria, as an illustration, has been reduced from a death rate of 15.9 to 2 per 100,000 population, besides a 25 per cent decrease in cases. The infant mortality rate in 1920 was 130, as contrasted with 39 for the past year.

Several unit cost studies were made of the inspection and other activities, leading to increased efficiency in administration. The net per capita cost of health department services for the 12 months was $1.25, including medical social service and emergency treatment clinics. These costs are analyzed in considerable detail by functions by the business manager of the department.

During the year, treatment clinics for the indigent sick were transferred to the general hospital administration. This change has necessitated careful studies of medical social service work in connection with the admission and follow-up of cases as well as in the education of the community. The county health department has exercised an important influence in the community for use by the School of Social Welfare of the University of California; it has three representatives on the Council of Social Agencies; and provided the Chairman of the health section of the State Conference of Social Work. Many public addresses on public health and medical social work were given by staff members.

In the maternity and child hygiene field, 3,722 child hygiene conferences were held, with 7,560 cases registered as having made 36,335 visits. Over 500 infants were referred to private physicians for medical advice and 439 to clinical services.

It is noticeable that in 1923 the chief cause of infant deaths was diarrhea and enteritis, whereas in 1931 the chief cause has shifted to congenital causes, thus indicating where intensive preventive work is still needed to reduce further the infant mortality rate.

In the county health department laboratory, during the past 10 years, there has been an annual average of 104 examinations per 1,000 population, at an average cost per test of $.38. During the past year the laboratory personnel numbered 18 per 100,000 tests.

New York State—The annual report for 1931 indicates that the appropriation for state aid to counties during the year amounted to $336,043; of this $191,197 was for half the expenditures of county health departments. In addition, $134,874 was appropriated for public health nurses, traveling and incidental clinic expenses, $14,125 for sanitary inspection, and $21,246 for hospitals, preventoria and health camps owned and operated by county governments. Forty-three counties received help in amounts varying from $825 in Oswego to $113,310 in Westchester County. In accordance with the State Education Law, state aid of $417,504 was given for the rehabilitation of crippled and handicapped children.

Some of the measures taken by the State Department of Health to combat the poliomyelitis epidemic, which started early in August, were:

1. Collection of an adequate supply of human blood serum from recovered cases
2. Establishment of emergency laboratory facilities
3. Appointment of competent local consultants on a fee basis to be available on call of physicians to assist them to make clinical and laboratory diagnosis at the bedside and to administer serum
4. Restriction of the use of poliomyelitis immune serum, as far as possible, to cases in the preparalytic stage
5. Provision for additional full-time epidemiologists as temporary assistants to district state health officers
6. Furnishing of information to the medical profession and the public generally of facts concerning this disease and of the availability of clinical and laboratory aids in diagnosis and treatment
7. Employment of additional nurses to render immediate assistance and to provide the necessary after-care

A follow-up survey is being made of all cases of poliomyelitis in districts where it has been especially prevalent during the epidemic.

The purpose of the survey is to determine, in so far as may be practicable and possible, the extent to which poliomyelitis immune serum administered in the preparalytic stage was of benefit; also, to ascertain in cases with neuromuscular involvement, their classification and the extent of paralysis.

LABORATORY

A YEAST EXTRACT MEDIUM FOR DETERMINING THE BACTERIAL CONTENT OF MILK BY THE PLATE METHOD*

E. D. DEVEREUX AND J. L. ETCHELLS

Michigan Agricultural Experiment Station, East Lansing, Mich.

IN bacteriological routine plate counting of milk, water, and other food products, the main purposes of a standard medium for cultivating the organisms are to obtain a fairly accurate qualitative and quantitative estimate of the bacterial content of the food and to obtain data that will be comparable to other data obtained in the same laboratory or other laboratories. These so-called standard media, or standard tests, are constantly subject to attack from the points of accuracy, simplicity of preparation or use, cost, and time consumed. It is largely with the latter point that this paper is to deal.

In recent articles by the senior author,[1, 2] a yeast extract medium was described which proved to be excellent for the cultivation of organisms occurring in milk, the medium being used either in the liquid or solid form. Preliminary experiments revealed the fact that this medium compared very favorably to plain nutrient agar in determining routine plate counts of milk using the technic prescribed by the *Standard Methods of Milk Analysis*.

EXPERIMENTAL

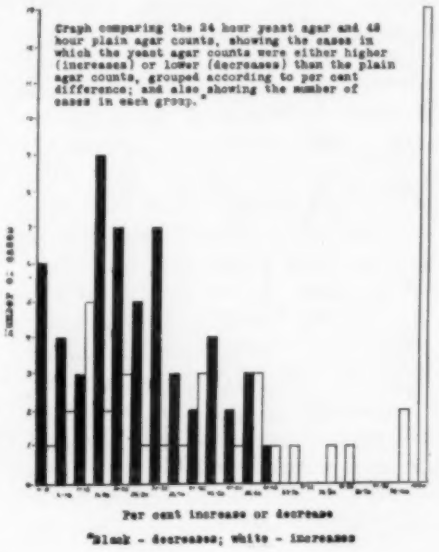
This medium differs from plain nutrient agar in that yeast extract and peptonized milk are substituted for meat extract and peptone, and dextrose is added.

FORMULA OF YEAST EXTRACT AGAR

Yeast extract (Difco)	5 grams
Peptonized Milk (Difco)	10 grams
Salt	5 grams
Dextrose	10 grams
Agar	15 grams
Distilled water	1,000 c.c.

Adjusted to pH 7 and autoclaved at 15 lb. for 15 minutes.

One hundred samples of raw milk were plated according to the method as described by the A.P.H.A. *Standard Methods for Milk Analysis*. One set of counts was obtained by using


Graph comparing the 24 hour yeast agar and 48 hour plain agar counts, showing the cases in which the yeast agar counts were either higher (increases) or lower (decreases) than the plain agar counts, grouped according to per cent difference; and also showing the number of cases in each group.
Per cent increase or decrease
Black - decreases; white - increases

* *Journal Article No. 121* (n.s.) from the Michigan Agricultural Experiment Station.

Standard Methods plain nutrient agar, and a duplicate set was obtained using the yeast agar mentioned above. The same dilution flasks were used to prepare both sets of plates in order to eliminate errors that might occur in preparing two sets of dilution flasks. The plates were incubated at 37° C. and counts were made at the end of 24 and 48 hours, the plates being removed from the incubator only long enough to make the counts.

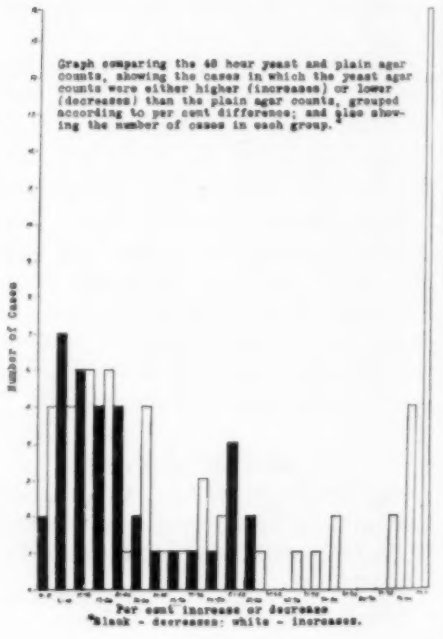
TABLE I—SUMMARY OF DATA

Summary	*24-hr. yeast agar count compared to 48-hr. plain agar count*	*48-hr. yeast agar count compared to 48-hr. plain agar count*
	Per cent	Per cent
Cases showing higher yeast extract agar count	42	60
Cases showing lower yeast extract agar count	56	37
Cases showing same yeast extract agar count	2	3
Maximum increase in yeast extract agar count	320	470
Minimum increase in yeast extract agar count	5	1
Maximum decrease in yeast extract agar count	64	59
Minimum decrease in yeast extract agar count	1	1
In those cases where yeast agar counts were higher; average increase	78	84
In those cases where yeast agar counts were lower; average decrease	27	23
All cases considered; average difference (increase) in yeast agar count	18	45

RESULTS

From the data obtained comparisons were made of the counts obtained in 24 and 48 hours on the yeast agar and the 48 hour plain agar counts.

A summary of the data is given in Table I, while in the bar graphs are given the cases in which the yeast agar counts were either higher (increases) or lower (decreases) than the plain agar counts, grouped according to per cent difference; and also the number of cases in each group. Averages of the data given in the graphs are presented in the table as the second and third items from the bottom. In the graphs it will be noted that the majority of the cases of lower yeast agar counts (decreases) are in the region of relatively low percentages. Although the cases of higher yeast agar counts (increases) extend entirely across the graphs there is, in each graph, a rapid rise in the region of relatively higher percentages where no decreases ever occurred. There were two cases in which the yeast agar counts, both the 24- and 48-hour sets, were 29 and 166 times the 48-hour plain


Graph comparing the 48 hour yeast and plain agar counts, showing the cases in which the yeast agar counts were either higher (increases) or lower (decreases) than the plain agar counts, grouped according to per cent difference; and also showing the number of cases in each group.
Number of Cases
Per cent increase or decrease
Blank - decreases; white - increases.

agar counts. These cases were not used in calculating the data for the table; however, in no other cases were the data withheld.

Returning to the table, it will also be noted that when the results of all the samples were considered the yeast agar gave counts in 24 and 48 hours which were on the average 18 and 45 per cent, respectively, higher than the 48-hour plain agar counts. This brings out at least two points, namely: that yeast agar counts made at the end of 24 hours will on the average be comparable to plain agar counts at the end of 48 hours, thus resulting in a saving of 24 hours; and 48-hour yeast agar counts will on the average be appreciably higher than similarly made plain agar counts. The types or organisms which appeared on the two media were essentially the same, the difference being that the yeast agar promoted a more rapid growth of all the organisms.

SUMMARY

A yeast extract agar medium was described and when used for determining the bacterial content of milk by the plate method gave counts at the end of 24 hours' incubation which were on the average comparable to plain nutrient agar counts made at the end of 48 hours, resulting in a saving of 24 hours for the completion of the test. Also it gave counts at the end of 48 hours which were on the average 45 per cent higher than similarly made plain agar counts.

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VITAL STATISTICS

Plague in British India, 1896–1931—Plague entered British India through Bombay in 1896, and rapidly secured a foothold throughout the whole Presidency; by 1902 it had spread to the Punjab, and a little later the United Provinces were involved. The incidence of the disease was at its worst in 1907, when no less than 1,160,000 inhabitants of this country died as a result of it. But since that year, there has been an almost continuous decline in the death rate, and some sanitarians believe that the disease, as an endemic infection, will soon cease to occur in India altogether. The reasons for this progressive reduction in the number of attacks are obscure, but appear to be connected with an immunity in some way acquired against the disease in this country by rats.

During the calendar year 1929, the total number of deaths from plague recorded throughout India amounted to no more than about 70,000, and the figures for the first quarter of 1930 were so satisfactory as to give reason for suggesting, in a previous report, that the depredations of the disease during 1930–1931 would be less than they had been for many years past. These anticipations were fulfilled. The customary seasonal rise in the mortality rate took place during the months of March and April, and the incidence of plague was for a time rather severe in the Eastern Districts of the United Provinces and in the Belgaum and Dharwar Districts of the Bombay Presidency; but despite this, the total number of deaths reported during the year was only slightly over 20,000, which

is the lowest figure reached since 1898 —the year immediately following that in which plague was introduced into India. The improvement was most pronounced in the Punjab and the Western portion of the United Provinces.—Calcutta: Government of India. Central Publication Branch, 1932, *India in 1930–1931.* p. 418.

The Diabetes Record of 1931—Diabetes, regardless of the insulin treatment and other advances of medicine, continues to increase. The diabetes death rate of 50 American cities, which in 1931 had a combined population of about 31,000,000, increased from 15.9 per 100,000 in 1912 to 24.6 in 1931. This is the highest rate which has ever been recorded for this country. The actual number of deaths in these cities increased from 6,890 in 1930 to 7,610 in 1931, or 9.1 per cent.

A study of the mortality from diabetes in 184 American cities in 1930 and 1931 shows increases in the latter year in 97 cities, decreases in 85, and the same rates for 1930 and 1931 in 2 cities. In 11 of these cities the rate exceeded 35 per 100,000, and in 6, it exceeded 45. The cities with rates above 45 in 1931 were Oak Park, Ill. (73.2); Atlantic City, N. J. (51.4); Madison, Wis. (46.5); New Haven, Conn. (45.5); Paterson, N. J. (45.4); and Syracuse, N. Y. (45.4). No satisfactory explanation of these excessive rates in particular localities has thus far been forthcoming. To some extent, of course, the rate is explained by admissions to local hosptials affording treatment to out-of-town residents, but this cannot account for more than a fraction of the extraordinary excess in the rate.

Equally puzzling are the low diabetes death rates for other localities. The 6 cities having rates of less than 5 per 100,000 were Greensboro, N. C. (1.7); Hamtramck, Mich. (1.7); Flint, Mich. (3.0); Montgomery, Ala. (3.0); Pueblo, Colo. (3.9); and Medford, Mass. (4.8). Somewhere between these extremes must lie an explanation which as yet has not resulted in even extended local research. It is true, of course, that the low rates are mostly for comparatively small communities and possibly the result of accidental departures from normal.

Comparing 1931 with 1930 diabetes death rates in the 5 largest cities of the United States, it is noted that the rate increased from 23.9 to 27.4 in Chicago; from 25.6 to 27.1 in New York; and from 16.1 to 20.7 in Philadelphia. It remained the same (15.3) for both years in Detroit; and declined slightly—from 20.7 to 20.4 in Los Angeles. In the aggregate, these 5 cities had 3,413 deaths from diabetes in 1930, against 3,797 in 1931. There is, therefore, an actual increase in the mortality of about 11 per cent, practically corresponding to the observed increase in 50 cities and 184 cities combined.

For relative position, these American cities may be compared with 60 foreign cities, which, for 1930, show a range in rates from no deaths in Reykjavik, Iceland, to a rate of 29.5 per 100,000 for Colombo, Ceylon. Assuming a rate of 15 per 100,000 as fairly normal, there were 17 foreign cities with rates higher than 15, while the corresponding excess in 184 American cities is represented by 126 communities. Among the 60 foreign cities, only about 28 per cent showed rates above the assumed normal rate of 15, while among the 184 American cities, 68 per cent exceeded this rate. Among 14 Canadian cities, with an aggregate population of 1,875,922 in 1931 the death rate from diabetes was 12.4 in 1931, as compared with 11.4 for the same 14 cities in 1930. The rate of 12.4 for 14 Canadian cities is in striking contrast

to the 1931 rate of 22.7 for 184 United States cities with an aggregate population of 42,895,109.—Frederick L. Hoffman, Diabetes Record of 1931. *Spectator*, 129:7 (Nov. 24), 1932.

Vital Statistics for Jamaica, 1931—The estimated population of the Island of Jamaica on December 31, 1931, was 1,050,667; males 509,465 and females 541,202. There were 3,604 marriages registered during the year as compared with 4,188 in 1930, a decrease of 584. The marriage rate in 1931 was 3.4 per 1,000 population, while in 1930 it was 4.1.

Births on the island numbered 36,173 during 1931, 18,344 boys and 17,829 girls. The birth rate was 34.8 per 1,000 of population. In the preceding year, there were 37,340 births with a rate of 37.0. Of the 36,173 births in 1931, 25,958 or 71.76 of every 100 births registered were illegitimate. This rate is higher than the 1928, 1929 and 1930 rates of 71.46, 71.47 and 71.75, respectively, though not as high as the 1926 and 1927 rates of 73.37 and 72.65, respectively.

There were 19,377 deaths from all causes registered in Jamaica during 1931, 9,704 of males and 9,673 of females, the death rate for the year being 18.6 per 1,000 of population. In 1930 there were 17,214 deaths with a death rate of 17.0. The 1931 rate of 18.6 per 1,000 is higher than the 1930 rate of 17.0, which was Jamaica's lowest recorded rate since the commencement of death registration in 1878, and slightly higher also than the 1929 rate of 18.4. The infant mortality per 1,000 births on the Island was 153 in 1931, as against 141 in 1930, 160 in 1929, 157 in 1928, and 173 in 1927.

In view of the fact that 67 per cent of the deaths registered on the Island during 1931 were not medically certified as to cause of death, an analysis of the principal causes of death would be of no significance. In the Parish of Kingston, however, certification is much better; here more than 85 per cent of the total deaths are medically certified by cause. Analysis of the principal causes of death in Kingston shows that tuberculosis, congenital debility, diarrhea and enteritis, diseases of the heart and pneumonia are by far the leading causes of death.—*Jamaica. Annual Report of the Registrar General's Department*, 1931, 1–5.

Low Death Rates in Autumn—The people of the United States and Canada usually have the benefit of excellent health conditions in the final quarter of the year; and this is the experience of the current autumn, to date. The death rates from October to December are much more favorable as a rule than in winter or spring, and are only slightly higher than the minimum mortality which prevails, year after year, in summer. This has been the experience of the Metropolitan Life Insurance Company among its millions of white industrial policy holders for the past 5 autumns. The average autumn death rate in this insured group was 7.5 per 1,000, as against 9.3 for the winters of the same years, 8.4 for the springs, and 7.1 for the summers. The average autumn mortality rate has been only little higher than that for the summer, as contrasted with a large increase between autumn and winter. In spring, the mortality rate improves over the winter figure due, largely, to a seasonal drop in deaths from respiratory diseases. But the spring death rate, nevertheless, is much higher than that for the autumn months.

Each individual cause of death has its own season of maximum and minimum incidence. Typhoid fever, diphtheria, alcoholism and automobile fatalities are the only ones of all the causes that show

their maximum mortality rates in autumn; and, in fact, the autumn diphtheria and alcoholism death rates for the 5-year period 1928–1932 were duplicated in the winter months. The average autumn death rate for automobile accidents was only slightly higher than the summer figure.

There are considerably fewer deaths from tuberculosis in the autumn and summer than in the other seasons. The average fall and summer death rates for this disease were less than 58 per 100,000 for the past 5 years, as against 68 and 69 in the winter and spring months respectively. The measles death rate is almost nil in the autumn, and deaths from whooping cough are also at their lowest point.

The seasonal incidence of suicide is of particular interest. In the wage earning group of the population, at least, the autumn death rate has been lower during the last 5 years, than that of any other season. For the population at large, it seems that the low point for suicide is reached during the winter season. One point is clear with respect to the white wage earning population, namely, that suicides are considerably more frequent during the spring than at any other season. The death rate reaches its peak, strange to say, in the month of May, which, many will agree is usually the pleasantest month of the year; and it is in the bleak months of December and January that people resort to self-murder least frequently.

Deaths of women from causes incidental to pregnancy and childbirth show a decided seasonal incidence. Among insured women, the autumn death rate for the 5-year period 1928–1932 was nearly 3 per cent lower than that for the summer season, more than 9 per cent lower than in the spring, and almost 16 per cent below that registered for the winter.—*Stat. Bull.* Metropolitan Life Insurance Co. 13:5–6 (Nov.), 1932.

Population of Japan, 1920–1925—In 1925 the population of Japan proper was 59,736,822. This was an increase of 3,773,769 over 1920, the rate of increase being 67 per 1,000 for the 5-year period. The average density of the population in 1925 was 156 per square km. compared with 147 in 1920. In 1925, there were 101 males to 100 females as compared with a ratio of 100.4 males to 100 females in 1920. In 1925 the portion of the population residing in cities of over 30,000 inhabitants comprised 21.6 per cent of the total. In the rural population there were 99.2 males to 100 females, while in the urban population there were 107.6 males for each 100 females. Native born Japanese comprised 997 out of each 1,000 of the total population; those born in oversea territories, 2 per 1,000; and the foreign born, only 1 per 1,000 of the total. The bulk of the 1925 population who were born in oversea territories were Koreans.

Infants under 1 year of age constituted the highest percentage of the total population. As age groups advanced thereafter, there was a noticeable decrease in the percentage of the population represented.

Agriculture was the source of employment for 14,128,360 persons; manufacturing industries employed 5,300,248; then commerce and finance were next with 3,188,002 persons employed. There were relatively fewer economically dependent persons in agriculture than in any other broad occupational group.—T. Hasegawa, *Bull. de l'Inst. Internat. de Stat.* 25(2):5–38, 1931; *Soc. Sci. Abstr.* 4:1672–1673 (Oct.), 1932.

PUBLIC HEALTH ENGINEERING

INCINERATION IN WASHINGTON*

JOHN BLAKE GORDON

Director of Sanitary Engineering, Engineer Department, District of Columbia, Washington, D. C.

IN 1919 a privately owned rubbish salvage and incineration plant was constructed in Washington. Shortly after its construction prices for salvaged goods fell to a point at which no profit could be made and the District of Columbia took over the operation of the plant under a lease from the owners. Under municipal operation, the primary function of the salvage plant was to dispose of rubbish, but material salvaged reduced greatly the load on the furnaces. During this period of operation the plant was destroyed by fire and rebuilt, but the furnaces proved inadequate even under 24-hour operation to handle the rubbish collected by the District, not to mention that collected by private contractors, and it became necessary to dispose of all rubbish by burning on the available dumps.

At the Washington Airport dump, private parties are allowed to dump rubbish upon payment of a fee to the airport authorities of $.50 a load. Material is deposited and picked over by a group of dump dwellers who at one time numbered over 200. This dump is fired whenever the wind is away from the city. Incidentally, a storm of protest from citizens associations and airport authorities, together with the anticipated completion of the two District incinerators, has resulted in an order from the Arlington County Commissioners that this dump be discontinued.

Garbage reduction at the District owned plant at Cherry Hill, Va., about 25 miles south of Washington on the Potomac River, has proved entirely satisfactory, and during prosperous years has yielded considerable profit by the sale of grease and fertilizer. This fact, together with the unavoidable odors which experience at the garbage transfer station has indicated may be expected from the handling of this form of refuse, were the determining factors in the decision to make the proposed incinerators for rubbish and street sweepings only.

HISTORY OF LEGISLATION

Accordingly, in 1922 an unsuccessful attempt was made to secure an appropriation from Congress for the construction of one or more incinerators and this attempt was repeated regularly until 1929 when an act was passed authorizing the expenditure of $850,000 for "the acquisition of land in the District of Columbia and the construction thereon of two modern, high temperature incinerators for the destruction of combustible refuse."

The first appropriation, made March 26, 1930, included an item for the retention of the services of a consulting engineer, in which capacity the District considered itself very fortunate in retaining Harrison P. Eddy, of national reputation as an expert on incineration.

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 26, 1932.

From this appropriation, sites approved by the National Capital Park and Planning Commission were acquired and, following a second appropriation of $300,000, ten bids were received March 17, 1931, on the basis of designs to be furnished by the bidders. Following complaint of one of the bidders, the Comptroller General of the United States ruled that it was illegal to let a contract on this basis in spite of the fact that comprehensive specifications had been issued limiting the designs and fixing the capacities. It was therefore necessary to have the consulting engineer prepare detailed designs of the furnaces, buildings, and equipment so that all bids would be made on one design. Accordingly, new bids were requested and on December 8, 1931, 24 new proposals were received.

During this controversy, the appropriation had lapsed and contracts could not be let until funds had been reappropriated. This was done, however, and on February 3, 1932, contracts were awarded to the Rust Engineering Company of Pittsburgh for the construction of the O Street Incinerator at a cost of $321,416, and to the North-Eastern Construction Company of New York and Baltimore for the construction of the Georgetown Incinerator at a cost of $169,268. This represented a saving to the District of $104,000 over the lowest previous conforming bids.

Extra orders for items such as water-cooled dampers, indicating pyrometers, and other mechanical and structural changes, as well as driveway paving done by the District, have increased the cost of the Southeast plant by approximately $18,000 and of the Georgetown plant by approximately $5,000. Time of completion was fixed at 270 days to the beginning of tests at O Street and 260 days at Georgetown, and both plants were completed well within the contract time.

CAPACITY OF PLANTS

The act of Congress authorizing this construction requires that the two plants shall have sufficient capacity to burn all "combustible rubbish and street sweepings" produced in the District of Columbia and also grants permission to certain Maryland and Virginia communities to dispose of their rubbish at these plants. Accordingly, the two plants were designed with a conservative rated capacity of 595 tons per 24-hour day, making no allowance for certain substantial areas of grate surface and perforated grate-surrounded castings which would materially increase the plant capacities. A distribution of 425 tons at O Street and 170 tons at Georgetown was made after an intensive study of collections within the various collection districts of the city in order to reduce to a minimum the length of hauls to the two plants.

MATERIAL TO BE BURNED

In general the rubbish to be burned is highly combustible. Nearly half of it is expected to be paper or materials made from paper, but there is a substantial portion which is incombustible, such as metal, glassware, and leather. When delivered to the furnaces, this material is very loosely packed and its combustion proceeds rapidly. In times of heavy rain, however, it will be very wet, and in all probability, auxiliary oil burners will have to be used. Leaves to be incinerated at certain times of the year may also be either dry, loosely packed and easy to burn, or they may have a moisture content equal to that of garbage. Street sweepings, other than leaves, heretofore used as filling material on the dumps will also be incinerated in these plants.

DESCRIPTION OF PLANTS

The buildings each have a low receiving room along one side and a high

main section, with a manifold flue out-of-doors connecting chimneys and furnaces. Provision is made at O Street for the future utilization of heat to provide power by the construction of boilers between the chimneys and the building proper.

Incoming trucks pass over weigh scales where weights are recorded before the trash is dumped into the receiving bins. These bins extend nearly the length of the buildings and have capacities of 50,000 cubic feet at O Street and of 25,000 at Georgetown, to provide sufficient storage capacity to operate full time. This storage is necessary, since collection is concentrated into 8-hour days, while the furnaces are operated 24 hours a day. It is not, however, intended to store material beyond a period of 1 day. Two cranes at the first named plant and one at the second handle the fuel from the bins into the charging hoppers on the charging floors and are rated to perform 35 definite duty cycles per hour at full load.

The charging hoppers have air operated gates which permit the stoker on the floor below to admit charges of 1 yard each to the furnaces at will. After combustion, the resultant ashes are automatically quenched and discharged through water-sealed ash gates, hydraulically operated, directly into trucks at Georgetown and into an ash car at O Street. This car in turn empties into a semi-automatic skip hoist which raises the ashes into a bin where they are temporarily stored until they are loaded into trucks for transportation to the dumps. Ashes from Georgetown will be used in filling low land at Foundry Branch just west of Georgetown University while the ashes from O Street will be used in the Anacostia Park development.

CONCLUSION

Official tests have been almost concluded at Georgetown and are about to be started at O Street. These tests so far indicate satisfactory construction and design and have shown that it will be possible to operate well within the estimated figure of $2.40 per ton, a figure obtained by a survey of various plants of like nature in several eastern cities.

Just previous to the award of the contracts, a manufacturer complained to the Comptroller General of the United States that the designs prepared for the District excluded his equipment. The Comptroller General ruled that there was no legal basis for his complaint. Later it was claimed that these incinerators infringed a certain patent, but upon advice from the Corporation Council of the District, work proceeded on the construction, and as yet no further action has been taken.

Previous to construction, the work was under the direct control of Major D. A. Davison, then Assistant Engineer Commissioner. The actual construction was carried out under the general supervision of the Engineer Commissioner, Major John C. Gotwals, with direct control invested in Harrison P. Eddy, Jr., the consulting engineer, and A. B. Greene, the resident engineer.

NOTE: It should be noted that technical descriptions of these two incinerators have been purposely avoided as requiring more space than is available. A detailed description of the design and operation of the District incinerators was prepared by Harrison P. Eddy, Jr., of the firm of Metcalf and Eddy, Engineers, Boston, Mass., and was delivered by him before the Sanitary Engineering Division of the American Society of Civil Engineers at Atlantic City, October 6, 1932. Copies of this description have been prepared and may be obtained by those desiring them.

A STUDY OF ZINC CONTENT OF CERTAIN WATERS AND ITS RELATION TO U. S. PUBLIC HEALTH SERVICE STANDARDS

THE United States Public Health Service has set a limit of 5 parts per million of zinc for waters used for drinking and culinary purposes. It has been found that there is an extremely wide variation in the solvent action on zinc of various waters. The degree of alkalinity, the amount of dissolved gases, oxygen and carbon dioxide, present in any given water will effect the rate of solution of zinc by said water. Zinc contamination, when existing, generally takes place within building limits. Zinc is seldom, if ever, present in water in street mains. Authentic cases of illness caused by presence of zinc in water are a matter of record. The amount of zinc constituting a toxic dose, in water, is open to discussion. It is shown that the proper chemical conditioning of water will result in preventing solution of zinc. Fairhall's method for determination of zinc is recommended as being the most accurate method now available.—Abstract of paper presented by R. M. Palmer, Chemical Engineer, 500 Fifth Avenue, New York, N. Y., before the Public Health Engineering Section of the American Public Health Association at the 61st Annual Meeting in Washington, D. C., October 26, 1932.

INDUSTRIAL HYGIENE

Appointment of Occupational Health Council in Massachusetts—An Advisory body to be known as the Occupational Health Council has been recently established in the Massachusetts Department of Labor and Industries. The council will be concerned with the occupational health problems of the state, the study of which has recently been inaugurated with the appointment of an occupational hygienist. The members of the council include prominent representatives of public health and industrial medical services, labor unions, employers' organizations, social and welfare organizations, and insurance companies.

The Commissioner of the Department ment said:

> We propose to give ourselves the benefit of the best advice obtainable from individuals and institutions concerned with the health of the working population, and we believe it no less important that these interests be kept informed of the work which we are doing. I do not anticipate the need for frequent meetings of the group as a whole, but hope rather for the counsel of its members as it is needed, their criticism as it is called for, and their support as it is merited.
>
> With all regard for the pressing necessity of extreme economy in government, I am confident that this new undertaking of the department will more than justify itself in the reduction of disease arising from inadequately protected industrial occupations in the commonwealth.—

Month. Labor Rev., U. S. Bureau of Labor Stat., 35, 3:541 (Sept.), 1932.

Death of Magnus Washington Alexander—Industrial hygienists will greatly regret the death of Magnus W. Alexander, an engineer by training, organizer and noted guide of the National Industrial Conference Board, which has published many important researches in industrial medicine, some in monograph form. He had headed the board since its organization in 1916.

Although born in New York, he obtained most of his schooling in Austria. Returning to America in 1893, he progressed steadily until he became engineer in charge of designing for the

General Electric Company, and, in 1918, became that company's consulting engineer on economic issues. He will be especially remembered for his comprehension of the importance of industrial safety and hygiene and his influence in promoting medical organization. Memorial articles may be found in the Sept. 20, 1932, issue of the *Conference Board Bulletin* (247 Park Avenue, New York). E. R. H.

The Dust Hazard in Air-Pressure Abrasive Blasting (Sandblasting)—Object of the Investigation: The investigation here reported was made for the Committee on Health Protection in Air-Pressure Abrasive Blasting of the National Safety Council, of which the senior author was chairman. It was a coöperative study in which the U. S. Public Health Service coöperated with the Council. The actual field surveys and analytical work were performed by Leonard Greenburg and J. J. Bloomfield.

The object of the investigation was to determine the actual extent of the dust hazard in air-pressure abrasive blasting as conducted under American industrial conditions, to discover what protective measures were in use and to estimate their efficiency.

Air-pressure abrasive blasting is employed in two fundamentally different ways—in sandblast rooms, where the worker must operate by hand, in the midst of the sandblast atmosphere; and by the use of barrels, tables and cabinets in which the castings are exposed to the sandblast in a closed chamber, with the worker operating outside.

When such work is conducted in closed devices employing sand as the abrasive, the air of the workroom generally contains a highly hazardous dust concentration—over 90 per cent of quartz, and an average count of over 20 million particles per cu. ft. When steel instead of sand is used, the quartz content falls to 3 per cent and the dust counts average from 8 to 15 million particles—a condition which should not cause silicosis. Studies show, however, that all four types of equipment investigated can be made safe by proper construction and maintenance.

In rooms, where the worker must operate in the actual midst of the sand blast, the dust content is, of course, enormous, averaging 155 million particles per cu. ft. with steel abrasive, and 969 million with sand abrasive.

Helmets depending on filtration are quite inadequate to protect the worker against such dust concentrations; and positive air-pressure helmets with wire mesh eye-screens are irregular and unreliable in their effect.

On the other hand, positive air-pressure helmets with glass eye-shields and an air supply of 6 cu. ft. per minute furnish complete protection to the worker under the worst conditions found in actual operation, yielding a dust content of less than 1 million particles per cu. ft. within the helmet, with 1,000.0 million or more particles per cu. ft. in the outside air and rising only to 3 million particles per cu. ft. within the helmet even when the outside air contains 4,000.0 million particles.—

Leonard Greenburg and C.-E. A. Winslow, *Arch. f. Gewerbepath. u. Gewerbehyg.*, 3, 4:577–599, 1932.

E. R. H.

Physiological Factors in Mine Ventilation in 1931—The hazards connected with work under abnormal air conditions are becoming of increasing importance from a financial as well as a physiological standpoint, due to the extension of compensation laws to include diseases caused by dusts, toxic gases, and abnormal temperatures and humidities.

The United States, with the exception of California, North Dakota, Wisconsin, Massachusetts, and Connecticut, is the only English-speaking country where silicosis is not compensated.

A summary of recent literature concerning effects on workers of exposure

to dusts is taken up in alphabetical order of countries—Australia, Austria, Canada, England, Germany, Italy, The Netherlands and the United States. In England and the United States especially there was much literature on the subject of silicosis (pp. 2–35).

A summary of recent literature on effects of toxic or noxious gases is next included by leading countries, with special reference to the United States (pp. 35–51). Abnormal temperatures and humidities follow, also by countries (pp. 51–66).—R. R. Sayers, U. S. Bureau of Mines, *Inf. Circular, 6645,* Sept., 1932 (mimeographed). E. R. H.

Compensation for Industrial Diseases—Prague—A law for compensation of industrial diseases became effective July 1. Workmen's compensation for accidents, however, has existed in Czechoslovakia since 1887. There are 25 diseases now on the list, and the government may add others. In addition to the usual industrial poisons (lead, phosphorus, mercury, arsenic, manganese, benzene, carbon surphide, carbon hydrogen, phosgene, carbon monoxide, hydrocyanic acid), a number of chemical substances, chiefly tar-products are enumerated that cause chronic eczemas and malignant growths of the skin. X-rays and radiums are also included. The list likewise contains cancer of the lungs, so frequently found in the mines of Joachimsthal. Infectious diseases resulting from occupations are covered, especially anthrax, glanders, and hookworm.

Other diseases covered are chronic changes in the bones and joints as the result of pneumatic drills and hammers. The most important group, however, is silicosis and siderosis. To this same group is added damage to the lungs by Thomas artificial fertilizer.

The last group comprises nystagmus and deafness as a result of working in mines. The accident insurance body has the right also to give a temporary pension to a patient who is willing to change his occupation.—*J.A.M.A.* (Foreign Letters), 99, 20:1705 (Nov. 12), 1932. E. R. H.

Department of Industrial Hygiene—Studies on methods of dust estimation have been continued in association with the Miners' Phthisis Prevention Committee and the Mine Air Committee with a view of standardizing practice in the use of the dust counter (konimeter). The purpose is to secure a reasonable agreement. It is found necessary to treat the spots to be counted to remove water soluble particles and carbon in order to secure greater accuracy (in silica dust estimations). The possibilities of crucibles with filter floors of porous porcelain so that particles may be graded in terms of size-frequency is also being investigated.

In the Biochemical Department, the diet used by the mine natives has been investigated especially as regards its content in vitamin A. The livers were obtained from cases dying of pneumonia, and the amount of vitamin A was compared with that found in accident cases used as controls. The vitamin A content of the controls appeared to be quite definitely higher than that of the hospital group.—The South African Institute for Medical Research, *Annual Report Year ending December 31, 1931,* pp. 16–18. E. R. H.

Facts on Child Labor—Based on the 1930 Census returns, there were 667,118 child workers, 10–15 years, inclusive, or 4.7 per cent (1 in every 21) of the children of these ages in the United States. These figures included 431,790, or 9.2 per cent (1 in every 11) children, 14–15 years of age.

Of the gross number, 469,497, or 70.4 per cent, were employed in agriculture; 68,266, or 10.2 per cent, in

manufacturing and mechanical industries (textiles 20,625, clothing 8,650, building 7,380, lumber and furniture 4,790, food and allied industries 4,324, and iron and steel and other metals 3,236); trade 49,615 or 7.4 per cent; domestic and personal service 46,145 or 7 per cent; clerical occupations 16,803 or 2.5 per cent; transportation 8,717 or 1.3 per cent; extraction of minerals 1,184 or 0.2 per cent; and others 6,891 or 1 per cent. These figures include also those in public and professional service, forestry and fishing.

Eleven southern states (named) had from 5.5 to 24.9 per cent of their children, 10–15 years of age, employed as child workers. Nine southern states had the largest number of child workers, followed by Pennsylvania with 24,000, New York 20,000, Missouri 14,000, Illinois 12,000, New Jersey 11,000, and Massachusetts 10,000.

Limiting the figures to occupations other than agriculture, 1.4 per cent of all the children, 10–15 years of age, in the United States were found in such occupations.—U. S. Children's Bureau, Washington, D. C. (Press release received November 4, 1932.) E. R. H.

Carbon Monoxide Poisoning in Garage with Doors Open—One of the members of the staff of the Maryland Department of Health collapsed in his garage while tinkering on his automobile and with the doors of the garage open while he worked. He crawled under the engine and, realizing suddenly that he was getting lightheaded, crawled out, and started out to the open door, but fell before he reached it.

A boy of 17 passing saw the figure collapsed over the fender and heard the engine running. The boy pulled the victim out into the open air, instituted artificial respiration until help arrived when the victim, still unconscious, was rushed to a nearby hospital. After the use of oxygen for 45 minutes, consciousness was regained.

(This case serves to illustrate that carbon monoxide poisoning is a matter of the concentration of the gas wherever it is, enclosure or no enclosure. Numerous other instances are also in the literature where mishaps have occurred out in apparently open spaces, as on cinder dumps, along side of furnace rooms, bustle pipes around blast furnaces, etc.—Abstractor).—Maryland Dept. of Health, *Press Bulletin 435*, Nov. 28, 1932. E. R. H.

State Requirements for Industrial Lighting—This handbook designed for the protection of women workers contains basic considerations; the importance of good lighting from the standpoint of eye fatigue (by Janet Howell Clark), the Code of the American Standards Association for Lighting Factories, Mills and Other Working Places; a resumé of state lighting codes; and state lighting requirements other than lighting codes.

The Women's Bureau has investigated about 1,300 establishments in 13 states during the period of more than 10 years. Of these, natural lighting was reported satisfactorily in 762, and artificial lighting in 538. As a rule, simply the judgment of the bureau's investigators was used rather than instruments of precision.

In April, 1931, only 13 states had lighting codes, 19 states had no legal requirements, 8 states and the District of Columbia had some general requirements applying to all parts of manufacturing and mechanical establishments, and 10 only some general requirements applying to certain limited places only. It is to be noted that these 10 states were: Connecticut, Illinois, Indiana, Michigan, Minnesota, Nebraska, Rhode Island, Texas, Virginia, and West Virginia.—U. S. Women's Bureau, *Bulletin No. 94*:65, 1932. E. R. H.

FOOD AND NUTRITION

A Comparative Study of Milk in Bottles With Single and Double Caps—Bottled milk in transit from the filler to the consumer is subjected to temperature changes which lead to expansion and contraction causing appreciable quantities of fluid to be extruded or sucked in around the edge of the cap. The transfer of extraneous organisms from the surface of the cap and lip to the contents of the bottle depends wholly upon the protection afforded by the cap.

The object of this investigation was to determine the extent of contamination that may arise in this way and to measure the nature of this contamination and the possibility of its constituting a definite health hazard. This study was carried out under the conditions of city and rural milk delivery. The bottles of milk used in this study were closed with the ordinary single cap and exposed to the ordinary treatment of transportation and delivery. Bottles of an exactly similar sort and similarly exposed but protected with an additional hooded cap were used as controls. These tests were carried out in the period of April to July, incl. The samples analyzed represented in each case the last deliveries of the day.

Volume changes in bottled milk, which may occur under actual conditions of handling, were also studied. Observations were made under conditions of rising and falling temperatures and recorded time intervals. The bacteriological determinations employed were as follows:

(a) Total count on the cap
(b) Test for *B. coli* on the cap
(c) Test for anaerobes on the cap
(d) The *Standard Methods* bacterial count of the surface of the cream
(e) Bacterial count of the whole milk

The tests on the cap were made after removing the outer cap or directly from the top of the single cap bottles. The results of this study are summarized as follows:

1. Significant volume changes in milk may result from differences in temperatures encountered.

2. Bacteria were more numerous on the single caps than on the inner protected caps. Anaerobic sugar fermenting organisms were found on single caps but not on the others. Positive tests for *B. coli* were obtained in 66 (61 per cent) in the single capped series and in 12 (13.6 per cent) of the protected cap series.

3. The bacterial counts of the surface cream averaged from 51 per cent to 121 per cent greater in the single capped bottles than in the double capped bottles.

4. *B. coli* was present with greater frequency in the surface cream of the single capped bottles than in the doubly protected bottles (47.5 per cent as compared to 10 per cent).

5. The bacterial counts of the whole milk averaged between 38 per cent and 64 per cent higher in the single capped samples.

The authors suggest that under certain conditions at least, milk in bottles sealed with the ordinary disc type cap may present a definite hazard to health. —M. L. Isaacs and I. Zeiber, *J. Hyg.*, 26:806 (Nov.), 1932.

Numbers and Types of Organisms Found in Certain Products Used in Infant Feeding—Various samples of powdered milk products were examined bacteriologically to ascertain the numbers of organisms present and to classify the bacteria into groups as cocci, spore-formers, gelatin liquefiers, chromogens, coli-like organisms and hemolyzers. The 20 samples examined consisted of 9 milk modifiers, 2 lactic acid whole milks, 1 synthetic compound, 3 modified milks, 1 protein milk, 1

special milk food and 3 powdered milks.

In 6 of the 9 milk modifiers the predominating organisms were spore-formers; in 1 milk modifier streptococci constituted the greater part of the flora; in 1 similar product short bacilli predominated and in 1 other sample cocci, short bacilli and yeasts were present. In the 9 milk modifiers examined the total counts ranged from 37 to approximately 32,000 per gm. of powder. Spore-formers, as few as 7 per gm. in one sample and as many as about 30,000 per gm. in another sample, were found in the milk modifiers. One of the samples contained no gelatin liquefiers, the others containing liquefiers ranging up to 3,900 per gm. No molds were present in 2 samples but in the other 7 samples molds were found ranging from 2 to 175 per gm. Eight of the 9 samples contained hemolyzing bacteria, the maximum being 9,783 per gm. found in one sample.

The predominating organisms in the 2 lactic acid milks were staphylococci and streptococci. Total counts on these 2 samples were 2,625 and 5,975 per gm. Spore-former determinations showed 80 and 1,342 per gm. One sample contained 20 gelatin liquefiers per gm.; the other contained some 400 such organisms per gm.

Molds were present in both samples, reported as 15 and 37 per gram. Also both samples contained hemolyzers (640 and 722 per gm.). Examination of one sample of synthetic compound showed a total count of approximately 21,600 per gm., spores about 2,800 per gm., gelatin liquefiers 286 per gm. and hemolyzers approximately 11,000 per gm. The organisms were mainly diplococci.

In the 3 samples of modified milks streptococci and spore-formers were found. The total counts on these samples varied from about 5,600 to 12,000 per gm.

Differentiating into groups the following figures are reported for the modified milks examined; spore-formers between 466 and 7,658 per gm., gelatin liquefiers between 210 and 3,800 per gm., molds between 0 and 41 per gm., and hemolyzers between 940 and 4,133 per gm.

Examination of one sample of protein milk showed the following results: total count 350 per gm., spore-formers 43, gelatin liquefiers 19, molds 42, and hemolyzers 24 per gm. The organisms in this product were cocci and short bacilli.

One sample of special milk food was examined showing: total count 6,150 per gm., spore-formers 358, gelatin liquefiers 153, molds 47, and hemolyzers 256 per gm. This sample contained staphylococci, streptococci and yeasts.

The organism found in the 3 samples of powdered milk were spore-formers, staphylococci and streptococci. In this product the total count ranged from 526 to 98,000 per gm. Differentiated into groups the following figures are given: Spore-formers from 65 to 1,000, gelatin liquefiers 47 to 458, molds 0 to 227, and hemolyzers 114 to 19,000 per gm.

No coli-like organisms were found in any of the 20 samples examined. The figures given in the report were obtained by computation, averaging the counts on all sub-samples taken from each can and from all cans of each product studied. Viridans and beta hemolytic streptococci were found in 5 different products and their presence was questionable in 2 others. Cultures of hemolytic streptococci obtained from one sample were not pathogenic for guinea pigs.—Helen A. Mattoon, *Am. J. Dis. Child.*, 44:16 (July), 1932.

Evidence of the Existence of a Dietary Principle Stimulating General Growth and Lactation—This is an extended study of effect of liver on the growth of rats as the result of pre-

vious reports in the literature as to the growth stimulating properties of both liver and lettuce when supplementing a complete synthetic diet.

The authors used a basal synthetic ration containing salt mixture, cod liver oil, wheat germ and dried yeast. Copper, although not added, is present in the mixture. Fresh ox liver was fed to 40 to 50 gm. rats at levels of 0.5 to 1 gm. per rat per day. There was a marked growth response at both levels compared to the controls but practically no difference between the 0.5 gm. and the 1 gm. supplements. The response in growth is rapid.

On autopsy no increase in adipose tissue was found. The increase is deemed much greater than could be charged to a biological variation. To determine transmissibility to offspring, rats were fed both control and liver diets before breeding. The mother received 1 gm. fresh liver daily during growth and gestation and twice this throughout lactation; the male received 0.5 gm. The young were given no liver and only the basal ration.

There was no difference in weight of the litters at birth and no marked difference for 21 days. At this point, however, a marked increase in weight occurred in the litters from liver-fed parents. The final weight of these rats ranged from 70 to 100 gm. heavier than those born of control animals. There was also evidence of a larger number of offspring from the liver-fed parents.

Equally satisfactory growth was evidenced in the young rats of liver-fed parents whether the preliminary liver feeding extended over 16 weeks or only 4 to 5 weeks prior to mating. It was also found that the liver had a stimulating effect on lactation.

Further experiments show this growth-promoting substance to be distinct from other accessory food factors, particularly with respect to vitamin B_1 or B_2 or mineral content (manganese). The only suggestion advanced by the authors is a stimulation of the anterior pituitary gland and the liver substance has been tentatively termed by them "physin."—Leslie William Mapson, *Biochem. J.*, 26:970, 1932.

The Transmission of Vitamin A from Parents to Young in Mammals—Reports on a few autopsies of newborn children indicating a very small store of vitamin A in the liver prompted this investigation to determine the transmissibility of this vitamin from parents to the young in the case of rats. Prior to the main experiment, colorimetric determination of vitamin A was made of the liver from embryo rats. It was found that the store of vitamin A in the fetus is small and is chiefly contained in the liver.

The chief experiment was on female rats with variations in the vitamin A content of the diet from weaning to pregnancy and the vitamin A content of the diet during lactation. Rats were divided into groups receiving separately a very low vitamin A diet, a moderate diet and a diet very high in vitamin A (carotene). Some of the young were killed at birth and the vitamin A determined in the liver oil. More of the young were killed and the livers examined at the end of 21 days.

It was found that vitamin A in the liver at birth is small and subject to little variation. It was not increased with large amount amount of carotene during pregnancy of the mother. The amount is much larger at weaning than at birth and more varied, depending on the carotene fed to the mother during lactation. This increase, however, is limited, apparently due to the amount of vitamin A which can pass into the milk.

In discussing the application of this experimental work to other species, it is concluded that in human beings it is necessary to feed the vitamin A directly

to the infant to build up its reserve of this factor.—William John Dann, *Biochem. J.*, 26:1072, 1932.

The Action of Copper in Iron Metabolism—In previous studies on the rôle of copper in hemoglobin formation the test has been made of the increase on pure iron alone against iron with copper supplement. This work was undertaken to determine how copper functions in this connection.

Litters of young rats were kept with their mothers on screens until weaning at 21 days. By determining the iron content of young rats at different periods during weaning it was found that with rats raised in this manner for 21 days the iron content is about one-half that of those raised by the old method on shavings, the actual figures being 0.10 mg. iron on screens against 0.25 mg. iron on shavings. The young rats after weaning were placed on whole cow's milk. When the hemoglobin had decreased to 2 to 3 gm. per 100 c.c. of blood, the iron content of liver and spleen was determined.

The remaining rats were then given 0.5 mg. of iron as pure $FeCl_3$ daily. At the end of 2 weeks, 2 of these rats were killed and livers and spleen analyzed. Iron was taken away from the remainder and they were fed 0.05 mg. of copper as $CuSO_4$ daily. After 2 weeks these rats were killed and the livers and spleens analyzed. The 2 weeks' feeding of pure iron showed no increase in blood hemoglobin but a decided increase in iron content of the liver and spleen. On the copper substitution the increase in hemoglobin was 2 gm. as compared with 0.1 gm. on iron, and the iron content of the liver returned to about the same level as before iron feeding. The total iron in the spleen increased slightly.

These results indicate that iron is assimilated and stored in the absence of copper but is not availbale for hemoglobin formation. Variation in this work was the continuation of feeding milk after 2 weeks on iron. There was a slight loss in iron content but not comparable to that when copper was fed. A comparison was also made between storage ability of the liver when organic iron was fed compared to inorganic. Livers in the animals on $FeCl_3$ contained about 5 times as much iron as those on hematin.—C. A. Elvehjem and W. C. Sherman, *J. Biol. Chem.* 98:309 (Oct.), 1932.

A Biochemical Study of Irradiated Milk—This work represents a study of the physical, chemical, and biological changes produced in milk—and milk fat—after excessive irradiation. The milk flows through a cylindrical apparatus with a carbon arc inside. The emanations are between 2,800 and 3,100 Angström units and of an intensity 1,260 times that of bright sunlight. Feeding experiments have shown that this irradiated milk has increased 16 times in vitamin D potency while the A factor is diminished only 14 per cent.

Milk is passed through the apparatus 8 times and then analyzed. The chemical composition is changed very little. The pH of the irradiated sample is slightly higher, accounted for by the reductions in bacterial count. Butterfat of the irradiated milk was made into butter and the butter analyzed. The chief difference here is the shorter induction period for oxidation after irradiation—20 hours compared to 17 hours.

The rate of digestion of the proteins of the irradiated milk was also determined both with pepsin and with trypsin. There was no retardation of digestion but in the case of pepsin at the end of 24 hours there was a slight acceleration in activity. In the case of pepsin the irradiated sample digested more readily during the early stages of digestion and at the end of 24 hours

was slightly surpassed by the non-irradiated sample. The rapid digestion is possibly due to a destruction of the anti-enzymes by irradiation.

Since the irradiation was deliberately excessive in these experiments the authors conclude that in normal irradiation there would be no detectable change in the composition or digestibility of such milk.—Arthur K. Anderson and Howard O. Triebold, *J. Dairy Sci.*, 15:469 (Nov.), 1932.

CHILD HYGIENE

UNITED STATES CHILDREN'S BUREAU

THE annual report of the Chief of the U. S. Children's Bureau is always of considerable interest to those concerned with the broader aspects of child welfare. The twentieth annual report recently issued is of special value in clearly pointing out the implications of the industrial depression, as it bears upon the various phases of child health, child labor, recreation, dependency, and delinquency. The report covers the activities of the bureau in relation to the following:

1. Unemployment and child welfare
2. Research and general educational work in maternal and child health
3. Extent of assistance granted under mothers' aid laws
4. Prevention and treatment of delinquency
5. Coöperation with state, county, and insular public-welfare agencies
6. Industrial hazards affecting working minors
7. Employed boys and girls in Rochester and Utica, N. Y.
8. Current statistics in child welfare and related fields
9. Legislation affecting child welfare
10. State child-welfare commissions
11. Publications issued, in press, and in preparation

The Children's Bureau is now the only Federal agency compiling reports relating to unemployment relief. . . . Since January, 1932, monthly bulletins have been issued by the Children's Bureau in planographed form showing trends in relief expenditures and number of families aided, and meals and lodgings for transient and homeless persons, in 136 cities of 50,000 and more. More than a thousand agencies or divisions of agencies have been coöperating in the project. . . .

The report of the study of maternal deaths in 15 states, made in coöperation with the state boards of health and state medical societies, was reviewed in great detail by individual members of the bureau's obstetrical advisory committee, and was considered at a 3-day meeting of the committee held in January, 1932. Because of the great value of the material the committee recommended further statistical analysis of a number of points, and the publication not only of the detailed technical report of interest to obstetricians but also of a condensed report for more general use. Revision of the detailed report is nearing completion.

A survey of the unusually high infant and maternal mortality in New Orleans has been undertaken in collaboration with the New Orleans Parish Medical Society, the departments of pediatrics and obstetrics of Tulane and Dillard Universities, the Child Welfare Association, the city board of health, the Touro Infirmary, and other agencies. Interest has been focused on the relation of the death rates to such factors as age, race, hospitalization, preventive care, attendant at birth, and district of the city in which the deaths occurred. Statistical analysis is being made of the infant mortality rates for children born in New Orleans during 1930 (the most recent year for which complete birth and death data are available) and of maternal mortality rates for 1929, 1930, and 1931. A survey of the facilities available in New Orleans for the care of infants and young children and for maternal care is being made by physicians of the bureau staff, and the report will cover all agencies and institutions which offer facilities for preventive as well as curative care. In addition, the bureau's consultant in obstetrics

has investigated currently the maternal deaths occurring in the city during the calendar year 1932 and reported the findings to a committee of the New Orleans Parish Medical Society. It is the purpose of this committee to study the data presented and to decide as far as possible whether or not the deaths should be considered as preventable. . . .

Short, intensive courses in obstetrics (given on request of state departments of health and county medical societies) for doctors in active practice, carried on for 2 years through the coöperation of the medical school of Emory University in Atlanta, Ga., were extended during the past year to rural communities in Kentucky and Mississippi. Courses are scheduled for New Hampshire, and the work is to be completed in Mississippi and Kentucky during the present fiscal year.

Analysis of material collected in the New Haven study of neonatal morbidity and mortality has continued. Because prematurity is the chief cause of neonatal deaths a special study of the care given premature infants in a number of communities is being made, 91 hospitals in 22 cities have been visited during the past year. The object of this study is to determine: (1) The provision made in hospitals for the care of premature infants and the type of care given; (2) the mortality from prematurity. It is well known that the smaller the premature baby the less the chance of survival, so that total mortality figures (usually the only ones available) are not so valuable as figures compiled by weight groups. Therefore, the coöperation of the hospitals visited has been sought in compiling mortality figures in four groups according to weight at birth. . . .

During the year the bureau undertook a short study, in coöperation with the Social Hygiene Society of the District of Columbia, of the problem of the exclusion of children from schools in the District because of venereal disease in an infectious stage. Reports indicated that such exclusion was often for relatively long periods; for example, it was stated in a recent health and hospital survey made of Washington under the auspices of the Washington Council of Social Agencies that 21 of 43 children under treatment at the social hygiene clinic of the District Department of Health on a given day had been excluded from school for one to four years. The purpose of the bureau's study was to determine, if possible, the actual extent of the problem, so that the results might be used as a basis for constructive planning for these children from the educational and social, as well as medical, point of view. Three hundred and twenty-one children were listed as excluded from school because of venereal disease by 4 agencies whose records were checked in detail. . . .

The trend of infant mortality in the United States from 1915 to 1930 was definitely downward, the average annual rate of decrease amounting to 3.1 per cent. The expected rate for 1931 on the basis of the 1915–1930 experience would therefore be between 67 and 55. The provisional rate, 62, is within these limits of expectation; the reduction is slight when the decline during 1915–1930 is considered but important in view of prevailing economic conditions. . . .

The latest figures giving infant mortality rates by cause of death are for 1929. In the 1921 registration area referred to, during the period 1921–1929, there is a statistically significant downward trend in infant mortality amounting on the average to 2 per cent annually. In the rates from natal and prenatal causes the decrease was about 1 per cent each year, in epidemic and communicable diseases about 4 per cent, and in gastro-intestinal conditions 8 per cent. The mortality from natal and prenatal causes reflects the prenatal care the mother receives and the care for both mother and baby at the time of childbirth as well as the neonatal care of the baby. Popular education as to the importance of breast feeding, the proper care of milk, the preparation of simple formulas, the introduction into the infant's dietary of the right foods at the right time, as well as the value of sunshine, fresh air, and good routine in the care of baby, explain the large reduction in deaths due to gastro-intestinal causes. Unquestionably this popular education has proved its value and should be continued. . . .

The only cause of maternal death in the United States for which 1930 figures are available is puerperal septicemia. In the 1921 area referred to, the rates from this cause decreased from 1921 to 1930 on the average 1 per cent per annum. The lowest rate for puerperal septicemia (22.6 per 10,000 live births) was recorded in 1930. Although more than 36 per cent of the deaths of mothers, even with this new low rate, were due to puerperal septicemia, a cause recognized as largely preventable by asepsis, it is encouraging to find that the trend is now downward.

The development of widespread medical interest in attacking the problems of maternal mortality and maternal care is undoubtedly a factor in the improvement which has been noted. State medical societies coöperated in the detailed study of maternal deaths made in 15 states during the last 2 years of operation of the maternity and infancy act, and sub-

sequent studies of a similar nature have been undertaken by a number of medical societies and city, county, and state health departments in their own localities, using the same schedule that was devised for the larger study. The White House Conference on Child Health and Protection has published a committee report containing a frank account of the failings of obstetric education in this country and recommendations for its improvement. Large attendance is reported at graduate courses in obstetrics which have been offered to physicians by state boards of health and county medical societies in a number of places. State boards of health have continued their efforts to train midwives in places where the midwife still exists. . . .

The fact that during the period 1921 to 1929 there was a significant* downward tendency of about 2 per cent a year in the deaths due to albuminuria and convulsions, which may largely be prevented by prenatal care, would seem to indicate that popular education in this respect is bringing results. Recent surveys show, however, that even now the great majority of women do not receive such care, and it is of great importance that facilities for education in maternal health should be increased. . . .

The Children's Bureau has three projects for promoting uniform reporting of statistics relating to children and child welfare. In 1920 it began to assemble and analyze reports on the issuance of work permits as a means of providing current information regarding the number of children receiving official permission to leave school for work. In 1927 it began to assemble reports from juvenile courts and to work out with the courts uniform practices in defining and recording cases, so that comparable delinquency trends would be available. Finally, in 1930, it took over the project for current reporting in selected metropolitan areas in some 22 fields.

The closing statement of this illuminating report should be taken seriously to heart by everyone interested in the welfare of the child.

Child welfare workers everywhere look to the coming year with much anxiety. It will take great effort to maintain the standards of service for children which were slowly developed during the years before the depression, to make sure that their interests are safeguarded in the general economies which the depression has made necessary. Neglect of the health, education, and general welfare of children will be permanently costly to the children and to the future of the country.—

Twentieth Annual Report of The Chief of The Children's Bureau to the Secretary of Labor, Fiscal year ended June 30, 1932. United States Government Printing Office, Washington, 1932.

PUBLIC HEALTH NURSING*

Twenty Years of Red Cross Public Health Nursing—In 1910 Lillian Wald, R.N., who was responsible for the establishment of the Henry Street nursing service and the school nursing service in New York City, wrote Jacob Schiff, one of the farseeing members of the Board of Incorporators of the American Red Cross, thus:

In the older countries armies of trained nurses are sent into remote country regions to nurse, to educate, to bring scientific, advanced humanitarian and sanitary messages to the public. In America, in a few sporadic instances only, are nursing care and protection against infection possible to the sick country person. . . . Why should not the Red Cross Society undertake the organization of a vast, far-reaching scheme of country nursing, getting such support and coöperation as may be possible from the dwellers in mountain, farming or lonely desert regions, coördinating and guiding all, and bringing the help of the nurse to scattered, isolated families? . . . There could be no larger or nobler work possible to the Red Cross Society of a country dedicated to peace.

This letter was presented at the annual meeting of the Red Cross, but no action was taken until the annual meeting the following year when Mr. Schiff offered $100,000 to start the enterprise and Mrs. Whitelaw Reid offered $10,000 for scholarships to prepare nurses for rural nursing. A trial year was agreed upon and was so successful that in 1913

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

"The Town and County Nursing Service" was established with a well chosen committee to sponsor it.

The efforts of this service were directed along three lines—spreading the idea of public health nursing throughout the country, seeking qualified nurses as the demand grew, and giving the nurses guidance and encouragement to insure their professional growth and success.

> One by one, to the southern mountains, to mining camps, to farming counties, to small towns, to an industrial village, went Red Cross nurses, often the first to undertake rural work in a given state, and with them went a constant stream of wise advice and encouragement.

From the very first the Red Cross realized that nurses needed special training to do this rural work and against great odds clung to high standards. The first nurse in charge of this service worked closely with the few postgraduate courses for public health nurses then in the country, and with leading visiting nurse associations, and was aided by Mrs. Reid's scholarship loan fund.

The World War had a crippling influence on the growth of the Red Cross nursing service, but at its close it received a tremendous impetus as many of the chapters which had been working at high pitch now turned their attention to community welfare needs. Red Cross nurses returning from military service were available for rural positions, and many hundreds were rushed to postgraduate courses on scholarships. National Headquarters increased its supervisory staff both in the office and in the field to keep up with the enormous demand for nurses in the rural communities and to direct the work into safe channels. At the height of the boom period the Red Cross had 2,100 public health nursing services which it had launched.

As war surpluses dwindled chapters began to think of getting tax support for their public health nursing services. Many transferred them to school boards and county health departments for financing after the demonstration had been made. Other chapters entered into partnership with public agencies in financing nursing services, and this proved a sound principle.

In the last few years the Red Cross has turned its activities to providing more nurses to meet the needs more adequately in a given community, and to refining its nursing procedures. Its thrice revised manual on rural school nursing is the leading textbook in this field.—Elizabeth A. Fox, Twenty Years of Red Cross Public Health Nursing, *Red Cross Courier*, XII, 6:173–174 (Dec.), 1932.

It would be interesting to know the number of states in which the American Red Cross was responsible for the establishment of a department of public health nursing in the state board of health. In 1920 the Red Cross nursing field representative for Indiana became also the director of the Department of Public Health Nursing for the State Board of Health. The state furnished her office but the American Red Cross continued to pay her salary and expenses until a few months later when the State Tuberculosis Association began to share equally in financing her. Later the State Board of Health took over all the financial responsibility for the department.

It would be difficult to overestimate the influence the American Red Cross had in establishing both city and rural public health nursing services in Indiana. Official funds are usually not forthcoming to finance a nursing service unless a demonstration has been made for from 1 to 4 years. The Red Cross chapters and county Tuberculosis Associations furnished funds and supervision for the demonstration here.

Now when official funds are again

failing and the continuation of many rural public health nursing services is in danger these nonofficial agencies are again filling the breach until they can again be officially resumed. E. F. M.

Why Not Make Use of the N.O.P.H.N.? — Katharine Tucker, R.N., general director of the National Organization for Public Health Nursing, who was appointed a member of the New York State Health Commission by Governor Roosevelt, has been appointed consultant in public health nursing to the State Department of Health.— *Health News*, New York State Dept. of Health, IX, 44:179 (Oct.), 1932.

To anyone who knows how haphazardly public health nursing started and is being carried on in many state health departments, the arrangement made between the New York State Health Department and Miss Tucker will have a strong appeal. Let us hope that it will set a precedent for other states to follow.

As a Private Physician Sees Us— If one physician asks another what he thinks of public health nursing he is apt to be greeted with a stare that asks "Now what are you about to start?" Then he probably replies that he knows very little about it. Sometimes he may remember a personal experience with a nurse when she was believed to have done such and such and said so and so.

In Toronto a physician thinks of a public health nurse as one who spends her time in teaching rather than in nursing. Members of the Victorian Order or the St. Elizabeth Order do not usually occur to him as being public health nurses. He does not know how the teaching nurse spends her day, and what he hears about her comes to him second hand. She is a member of a group; he is on his own. He fears her because he does not know her and because she appears less as an individual than a group member. If he could only know her as an individual his apprehension about her activities would probably fade away.

A nurse can make no better contact with a physician than to be present at a confinement in a private home. Yet very few public health nurses are in delivery service. It is very seldom that the nurse who gives prenatal supervision to a patient does the actual obstetrical nursing also. There may be another nurse who does the follow-up infant welfare work. The continuity of favorable relations between one physician and one nurse is broken and the arrangement makes the physician seem unimportant.

It is astonishing how long a doctor remembers an indiscretion of a public health nurse. It makes him twice shy of her. Every doctor should be asked to report any indiscretions on the part of nurses to their organization so that misunderstandings could be adjusted at the beginning.

It would be good for the doctor to know of the nurse's constant attempt to refer his patients to him, keeping herself in the background; it would help a great deal if he could know what the nurse is able to do for him. He already makes use of the public health laboratory; he should make equally good use of the public health nurse in getting her to see that the families he is attending carry out his instructions. But how can he be assured that she will not give advice to his patients without his expressed desire unless he knows her well enough to trust her?

The doctor gets a long distance view of public health nurses busying themselves with what appear to him as trivialities. For much of this work he cannot see the need of a nurse's training.

A doctor's survival in his profession depends on whether his advice is accepted, the public health nurse's does not. In her zeal to help a family in

health matters she may forget that the family physician must assume the responsibility; potentially he is the most important cog in the working out of preventive medicine.

There are many fair minded physicians who are more content and easier in their minds when the public health nurse does not visit their patients. The nurse who criticises the physician would soon cease if she had to assume his responsibilities for only a short time.

Those interested in furthering the welfare of preventive medicine could not do better than in interesting the private physician in this work. It is infinitely more important to make sure of his coöperation than to attempt the training of the whole public. By the very nature of his education and work he will be the most easily interested. When the time has come that his importance is realized and full use is being made of him and when his confidence is sought and won, then will he seek out the public health nurse in his work. Then and only then will he think well of public health nursing.—A. M. Jeffrey, M.D. The Private Physician Looks at Public Health Nursing, *Canad. Pub. Health J.*, XXIII, 10: 459–463 (Oct.), 1932.

As the Public Sees Us—It would be a great deal easier for the public to understand what public health is if the public health workers could only agree on a definition themselves. In the *Survey of Nursing Education in Canada* nurses were even asking themselves if nursing was a profession.

One lay person gave this definition of public health nursing, "It is not really nursing at all; it is a camouflage to call it nursing it is really the teaching of hygiene, and it is called nursing because people are more in favor of nursing than teaching; and so it is easier to get it paid for out of taxes."

The public is a composite of groups in the community, all of which have different ideas of public health nursing.

The tax payer comprises one group. He sees public health nursing as "the latest fad to deplete his 'wad' or the last frill to empty the tradesman's till." The best way to meet this gentleman is to subject him to a steady drip of information as to the cost of public ill-health.

The individualist is in another group. He likes independence of mind and body and dislikes "molly-coddling." In self defense we need regulation of public health in our modern communities; public health is not an individualistic matter.

There is the conscientious objector whose religious faith or social prejudices make him look askance at any attempt to coerce him in health matters. Simple statements as to the achievements of public health in saving child life, and in reducing infant and maternal mortality are probably most effective in convincing him of its value.

Then there is the conscientious critic who has known a case where a public health nurse diagnosed a case or tried to treat a patient. He thinks public health nursing is an unauthorized invasion of the physicians' territory. The public health and nursing profession are with this critic in his views, but "he should not judge a stocking by its holes."

The public is a little suspicious of a nurse who lectures instead of poulticing; that is why the work of the visiting nurse has such strong appeal; it appeals to the emotion and instincts, and "the public loves to feel and hates to think."

Despite all these apparent criticisms of public health nursing the *Canadian Survey* states that the attitude of the public is 59 per cent ideal toward public health nursing. "There is a growing volume of instructed opinion behind this work despite the fact that, in this time of financial distress, economies are apt to take strange directions."—Adelaide M. Plumptre, The Public Looks at Public Health Nursing, *Canad. Pub. Health J.*, XXIII, 10:463 (Oct.), 1932.

EDUCATION AND PUBLICITY*

In Magazines and Books—We would like to record books and magazine articles about health and health workers. Please tell the editor when you discover anything, either sympathetic or otherwise.

"The Nurse in Current Fiction" reviews four books: "Hospital," by Truax; "District Nurse," by Baldwin; "Miss Pinkerton," by Rinehart; "The Affair at Tideways," by Heath. *Trained Nurse.* Aug., 1932.

A Publicity Council In Your City?—Sixteen cities have social work publicity councils. Health workers are prominent in most of them. Why not a health education group in every one of them? Health workers have much to gain from general discussions of interpretation, education or publicity. Also there is much to gain in small groups getting together to study health education as such. Where the chest or council of social agencies has not formed a publicity group those interested in health publicity and education might bring it about. Plans for such groups will be supplied by Social Work Publicity Council, 130 East 22d St., New York.

Posters From Far and Near—Through the courtesy of League of Red Cross Societies and other health agencies, several years ago *Hygeia* reproduced in miniature some of the world's best health posters. Only recently did we learn that those reproductions are available on a set of sheets, 8½" x 11½", at *25 cents.* Address *Hygeia,* 535 North Dearborn St., Chicago. While much reduced in size, the original brilliant colors are preserved. The 44 posters came from Bahia, France, Germany, China, Lithuania, Russia, India, Japan, and Latvia. The posters from India and Russia deal with prenatal care, but the remainder are suitable for home and school use. Children will delight in studying the Chinese poster lesson in hygienic eating with chopsticks, and the colorful Japanese posters on swatting the fly and brushing the teeth. The happy French posters on bathing and outdoor sports, the German mother, the Lithuanian "little mother," and the grotesqueries from far-off Bahia will appeal to the children.

What to Tell About Public Health—The freshest collection of quotable and usable material is contained in the series entitled "Behind the Front Lines," issued by Association of Community Chests and Councils, Graybar Building, New York. Subjects: "Child Health," "Hospitals," "Mental Hygiene," "Public Health Nursing," "Social Hygiene," "Tuberculosis." Write your national, or send *10 cents* a copy for any of these bulletins.

The "Smithson Family" In Connecticut—The summer experiences of the "Smithson family" were revealed by radio last July, August and September. The State Department of Health caught them via the microphone for 5 minutes every Wednesday according to the following schedule:

The family is discussing vacation.
They enjoy a picnic lunch.
They take Aunt Adelaide who does nothing but talk about her grandchildren. A. Elizabeth Ingraham, M.D. (as Aunt Adelaide).
They stop for advice at health officer's

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

office. Stanley H. Osborn, M.D. (as Dr. Brown, Health Officer).

Father receives first-aid. Sarah R. Addison, R.N. (as the public health nurse).

Joe discusses his future with Uncle Bert. Albert S. Gray, M.D. (as Uncle Bert).

They look for a good place to eat—Uncle Warren along. Warren J. Scott (as Uncle Warren).

They are disappointed that Cousin Stan fails to bring his little girl along. S. Harcourt Peppard, M.D. (as Cousin Stan).

Joe cuts his foot—They visit the doctor's office. Millard Knowlton, M.D. (as Doctor Millard).

Betty has a good time at an amusement park, Cousin Henry along. Henry P. Talbot, M.D. (as Cousin Henry).

They stop at the Lee Dairy for milk—Friend Lee Mickle (as an old friend, Mr. Lee).

Joe and Cousin Larry make a rush trip to a school. Lawrence A. Fagan (as Cousin Larry).

They are curious about a drive for funds for a dental clinic—Uncle Clyde along.

The family included: father, William C. Welling; mother, Elizabeth C. Nickerson and Ruth A. Kearns; Joe, aged 17, J. Henry Giles of the Bureau of Sanitary Engineering; Betty, aged 14, Jean Evans of the Bureau of Administration.

For mimeographed copies of the series send *10 cents* to Elizabeth C. Nickerson, State Dept. of Health, Hartford, Conn.

LOW COST DIET

"Publications On Low Cost Diet," issued by Social Work Publicity Council, 130 East 22d St., New York, in a much revised and amplified edition is divided into two parts. One part lists leaflets, folders and booklets for health and social workers, and *administrators* of food budgets. Another part lists material suitable for distribution, or for reproduction for distribution. 5 mimeographed pages. *6 cents.*

"Thrift in Food For Health Protection," by Lucy H. Gillett. 4 pp. Secure from a state or local tuberculosis association. "Health During the Growing Period," "The Health Account of the Adult," "The Best Food Values at Minimum Cost." Not for lowest income groups. *Samples free* from National Tuberculosis Association, 450 7th Ave., New York.

"Good Food for Little Money" to protect the health of Children, by Lucy H. Gillett. American Child Health Assn., 450 7th Ave., New York. 2 pp. A very condensed "guide to the wise and economical selection of foods for the family." 1 to 3 copies, *3 cents* each; 4 to 9 copies, *1 cent* each. Lower rates for quantities.

"Good Food For Little Money," by Helen MacMurchy, M.D., Dept. of Pensions and National Health, Ottawa, Canada. 14 pages; 3 x 6 inches; in English or French. "The trouble in Canada at present is not so much that we cannot get food. We can generally get food. But we need to choose our food better, to cook it better, and to use it to the best advantage."

"Food Helps For 1932–1933," a 4-page folder, New York Tuberculosis and Health Assn., 386 4th Ave., New York. Lists publications for the worker and for distribution, and motion pictures and posters offered for use in New York City. No copies of the folder are available.

A course in emergency nutrition problems was offered in December by the Boston Health League and the Boston Council of Social Agencies. Limited to 100. Topics: "Nutrition and Social Welfare"; "Low Cost Budgets—How Essential Are They and How Practical Can They Be?"; "Low Cost Budgets—How Can We Teach Families to Follow Them?" "Tulsa Plans and Other Makeshifts in Food Budgets."

A series of large-page folders and leaflets has been prepared by a group of Boston nutrition services, and is distributed by the Boston Health League. They are well printed, with good, read-

able type. They are notable for the effort to teach simple nutrition facts. Several interesting devices will help the better educated readers. One device is a series of illustrated paragraphs, such as:

(Picture of milk bottle)
1 quart daily for each child
1 pint daily for each adult
gives
calcium for bones and teeth
protein for growth, muscle and repair of the body
sugar for energy to work and play
vitamins for health and vigor

One wonders how far we can go in teaching even elementary dietetic science when people are harassed with fear of having a mere sufficiency of food.

HONORABLE MENTION

To *Welfare Advocate,* Public Welfare Commissioner, Manila: for improvement in paper and printing, and for improved folding for the mails. (Much space is given to public health topics.)

To Milbank Memorial Fund, New York City: for the chapter on "Health Education" in its report for 1931. a record of varied and valuable service in diverse coöperative efforts.

To United Hospital Fund of New York City: for annual report with a table of contents.

To New York State Department of Health: for annual report with table of contents and index (although not complete).

REPORTING

The House of Open Doors is a report, but not an "annual report," of the Wisconsin Anti-Tuberculosis Assn., Milwaukee. It is a chatty, readable tour of "the old gray building on Jefferson Street" where so much is done that concerns so many people in Wisconsin. It is mimeographed, with at least one informal sketch on each of the 9 pages. Copy for *10 cents.*

January 1, 1933, Commissioner of Health Shirley W. Wynne submitted to the Mayor of New York City a 9-page review of the work of the department *with statistics for 1932.* Of the per capita expenditure of 68 cents it was reported that "less than 1 cent is spent for the work of health education including the publication of pamphlets, the preparation of radio talks, the organization of lecture meetings, and exhibits, and the issuance of bulletins of information to newspapers, magazines, etc."

CHILD HEALTH EDUCATION

"Some Recent Contributions to Health Education": A list compiled as a service to instructors giving courses in health education. American Child Health Assn., 450 7th Ave., New York. 4 mimeographed pages. Single copy *free.*

"Some References on Child Care and Training" for those conducting child care classes in secondary schools or parent-teacher groups. American Child Health Assn., 450 7th Ave., New York. 5 mimeographed pages. Single copy *free.*

"Safety and Health of the School Child," by J. F. Rogers, M.D., of U. S. Office of Education. 29 mimeographed pages. 1932. "A self-survey of school conditions" covering "Physical conditions of the school plant affecting the life and health of the child," "Mental conditions of the school influencing health," "Bodily conditions of the child affecting his life and health and that of others," and "Teaching staff," with "reading references." *10 cents.* Superintendent of Documents, Washington, D. C.

Journal of Home Economics, Baltimore, carries considerable material on nutrition and its place in health education in the schools. *Sample free.* In Nov., 1932, issue: "Nutrition Needs of the School Child and the Responsi-

bility of the Home Economics Teacher," by Lydia J. Roberts; "Health Education in the Public Schools of Akron, Ohio," by Martin and Davison. (The last is a National Dairy Council project.) *30 cents.*

Again the Child Health Education Service of the National Tuberculosis Assn., 450 7th Ave., New York, invites women candidates for a full tuition scholarship of $500 at the Massachusetts Institute of Technology.

From the University of Texas, Bureau of Nutrition and Health Education, Austin, come three publications of a series: "Activities of Frogs and Toads" (4th grade; 20 cents); "Activities of Birds" (5th grade; 20 cents); "Activities of Honey-bees" (6th grade; 25 cents)—all by Jeanie M. Pinckney and Alice H. Miller. Each "is one of a series of units of health instruction published in workbook form. The purpose of these work books is to teach growth, development and social hygiene. . . . The pupil is presented with a series of problems which he solves himself."

ADVERTISING

"The Urge to Excess" discredits claims made in certain coffee and laxative advertisements. *Journal of A.M.A.*, Chicago. Nov. 19, 1932. Good to add to your portfolio or scrapbook of debunking food and drug material offered to the public for reference.

Good for similar use is a series entitled "Know-your-drugs," issued by U. S. Department of Agriculture, Washington. Ask for *Clip Sheet* issues containing the above series.

MOTION PICTURES

"There is an urgent demand for new and up-to-date films if this form of service is to be continued. The use of 16 mm. films as recommended by the Film Committee would materially cut down the cost of this service."—Ernest D. Easton, New Jersey Tuberculosis League.

"Motion Pictures as an Aid in the Teaching of Nursing Procedures," by Anne M. Goodrich. *Trained Nurse,* New York. Nov., 1932. The value of pictures; problems in taking and using pictures. Illustrated by selections from pictures already available through Anne M. Goodrich, 108 East 38th St., New York. In 35 mm. and 16 mm., for rental or sale.

"1000 and One—the Blue Book of Non-Theatrical Films." *Educational Screen,* 64 East Lake St., Chicago. 1932–1933 edition. 128 pp. *75 cents; 25 cents* to subscribers to the magazine. Classified lists of silent and talking pictures, both 16 mm. and 35 mm., free and otherwise. Includes physiology, health and hygiene.

DISCONTINUED

"Tidings," Child Hygiene Division, Massachusetts Dept. of Health, has ceased publication "for a while."

The weekly health and communicable disease bulletin of Oregon State Board of Health has lost the franking privilege. The mailing list will be limited to health officers and newspapers, and to those who will pay postage at one cent a copy.

RADIO

"Writing the Home Economics Radio Program," by Morse Salisbury. *Journal of Home Economics,* Baltimore. Nov., 1932. Reprint, *10 cents.* Get a copy, change "home economics" to "health education," and you have a most stimulating and practical guide to effective radio presentation.

In same issue of the *Journal* are several editorial notes on broadcasting. *30 cents.*

Radio talks during the Christmas seal sale in Ohio: "Robbing Tomorrow to Pay for Today," "Health and the Depression," "Short Cuts,"

"Dollars and Sense," "Health Consciousness," "Tuberculosis and the Press," "What Are They Singing?"

Radio talks in New York City's Christmas seal sale: "Something to Be Thankful For," "A Tiny Friend of All Children," "Youth's Greatest Asset," "Public Health in the Red," "Hidden Children," "Have You a Health Problem?" Three of the series were given over N.B.C. or Columbia chains.

EDUCATIONAL MATERIAL

"Illumination and Eyesight in Industry," by LeGrand H. Hardy, M.D. National Society for the Prevention of Blindness, 450 7th Ave., New York. 12 pp. *10 cents.* For the employer, safety director, industrial physician or nurse, labor leader.

The 1932–1933 catalogue of publications, Commonwealth Fund, 41 East 57th St., New York, has sections on "Health," "Mental Hygiene," and "Mental Hygiene Pamphlets."

The Educational Department, California Fruit Growers Exchange, Los Angeles, Calif., offers a 1933 series of bulletins for food teachers and nutrition workers.

The Full Endorsement of the Advisory Council—A distinguished group of men have promised again what has been promised before but probably never realized as yet. *"Only those manufactured products which have the full endorsement of the advisory council"* "will be given a place" in the first annual New York Food and Health Exposition, Grand Central Palace, New York City, April 3–8, 1933. The "full endorsement" is promised by Dr. Wynne of New York City, Dr. Parran of New York State Department of Health, Dr. Mendel of Yale, Dr. Rosenau of Harvard, and Dr. McCollum of Johns Hopkins.

It would be interesting to learn the procedure by which this competent group bestows or withholds its "endorsement," and how it will function when desperate space salesmen sell space to a product which is not 100 per cent endorsable. And will the endorsement cover the advertising claims made for the product, as well as for the merits of the product?

In Your State—Due to the curtailment of the activities of Cleanliness Institute, the National Tuberculosis Association has been designated by that organization as the repository and distributor of all their printed matter dealing with public health. The National Tuberculosis Association has made arrangements through its state and local associations to distribute this material to schools, industries and the general public in accordance with the general plans that have been established by the Cleanliness Institute. Any persons desiring publications of the Cleanliness Institute should make application to their state or local tuberculosis associations.

MAGAZINE ARTICLES

"Where the Normal Diet Fails," by E. V. McCollum. *McCall's.* June, 1932.

"Medicine Marches Forward," by Alva Johnson. *McCall's.* June, 1932. "Progress will always seem slow enough. The age of miracles is past, and human ailments are too numerous and elusive to be conquered in one swift campaign."

"Birth Control: A Balance Sheet," by R. E. Baber. *Forum.* Nov., 1932. Health aspects; social and economic factors; moral and religious factors; the balance sheet.

BOOKS AND REPORTS

A Century of Public Health in Britain, 1832–1929 — *By J. H. Harley Williams, M.D., with a foreword by W. W. Jameson, M.D. London and New York: Macmillan,* 1932. 314 pp. Price, $2.50.

This is a book that adds sunshine to the work of a reviewer. As a believer in the historical foundation of teaching and progress, the writer welcomes it with more than usual pleasure. In America we recognize that we owe to England the foundation of our enthusiasm for public health, or what has been called the "sanitary idea." The author says that the title of his work might well have been "The History of Public Health Prejudices."

The history covers the period 1832–1929 inclusive. All facts are easily available, since what we call modern public health is almost entirely a product of the last 100 years, though it would be ungracious to forget, for example, the Jewish sanitary laws as given in the Pentateuch, the water works system of ancient Rome, and the high degree of sanitary practice which existed in the Isle of Crete. However, most of these things had been practically forgotten, and we woke up only after Chadwick's inquiry of 1842, "the earliest example of the way in which scientific examination of the technical data of ill-health becomes the basis of legislation."

The author begins with the Poor Law Act of 1834, carries us through the Public Health Act of 1875, the attack on the Poor Law, and the Local Government Act of 1929. He considers the National Health Insurance Act (in force July 1, 1912) as perhaps the greatest social measure of this generation, and the most important influence in medicine since the Public Health Act of 1875.

A section, 71 pages, is given to tuberculosis, in which the author traces the development of anti-tuberculosis measures, stressing the founding of dispensaries by Sir R. W. Philip, who was knighted in 1913 for his achievements; the Act of 1911, in which funds were made available for sanitariums, and the founding of such institutions as Papworth Village and Preston Hall Village. One would think from reading this section that the demonstration of the danger of bovine tuberculosis to human beings was the work of the English Commission appointed after Koch's memorable blunder in 1901. The author has apparently never heard of the work done in America at the Laboratory of the State Live Stock Sanitary Board of Pennsylvania, which published its demonstration of Koch's fallacies in April, 1902, nor of the German Commission which reported about the same time that the First Interim Report of the British Commission appeared, in 1904. Since the author is connected with the National Association for the Prevention of Tuberculosis, he should know and give history somewhat more correctly.

We must also differ with the author in the three lines he gives to Oliver Wendell Holmes concerning puerperal fever. He speaks of Holmes's work as a suggestion, and states that he did not follow up his idea. Holmes's paper was printed in 1843, and reprinted 6 times between that date and 1891. Holmes said distinctly "Puerperal fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses," and also that he had abundant evidence that many

practitioners had been more careful in handling puerperal cases as a result of his warnings.

Vaccination against smallpox is treated of in Part VI, and the demonstration of its value is so clear that one finds it hard to understand the objections raised to it. Conscientious objection has hit England hard. Coercion is repugnant, but education and continuous propaganda must be pushed. The psychological side was given by the *Times* in 1858: "The English people decline to be bullied into health."

The volume closes with sketches of Chadwick, Simon, Florence Nightingale. Francis Galton, and Lord Shaftesbury, all of which are interesting. The index could be improved. The printing and make-up of the book are excellent, and in spite of some faults, we consider it one of the most interesting as well as useful books which have come to us for a long time. MAZÝCK P. RAVENEL

Medicolegal Cases. *Abstracts of Court Decisions of Medicolegal Interest. Edited by William C. Woodward, M.D., LL.M. Chicago. American Medical Association,* 1932. 1336 pp. Price, $7.00.

One of the valuable features of the *Journal of the American Medical Association* is its Medicolegal Section, in which current court decisions on various aspects of medical jurisprudence and legal medicine are abstracted each week. During the calendar years 1926 to 1930, there were included in this section approximately 1,300 cases, a figure which affords an interesting commentary on the vast amount of litigation involving the medical profession, especially since a large number of these decisions were concerned with malpractice or alleged malpractice.

All of these excellent abstracts have been collected in this impressive volume, preceded by a table of cases, and followed by a comprehensive index. Each case has an appropriate heading, indicating its salient points, and a citation is given to the volume and page in the national reporter system where the complete law report may be found. The value of these references would have been enhanced if citations to state reports had likewise been presented.

Although much more work would have been necessary if these abstracts had been arranged more closely by subjects, consultation of pertinent cases would have been facilitated by such an arrangement. It would, of course, have been impossible to do this completely, as one decision may include several important points of law. The index, which is a noteworthy feature of the book, permits of ready location of cases on topics with which the reader may be concerned.

A number of decisions on public health are included. Not all of these are indexed under "Health" or "Health Departments," however, but some will be found listed under "Food," "Vaccination," the names of specific diseases, and under other appropriate titles.

The Bureau of Legal Medicine of the American Medical Association, directed by Dr. Woodward and manned by a staff of competent lawyers, is to be congratulated on the publication of this volume, which will prove of inestimable value to physicians involved in legal matters requiring adjudication by the courts. JAMES A. TOBEY

A Guide to Human Parasitology—*By D. B. Blacklock and T. Southwell. Baltimore: Williams & Wilkins,* 1932. 271 pp. Price, $4.00.

The text is intended especially for the practitioner who does not have access to a laboratory where parasitological diagnoses are undertaken and who may be required to diagnose diseases caused by animal parasites.

It will also prove valuable for medical students taking special courses in human parasitology. The discussions and definitions are intended to apply to those species or groups of parasites found in man, and not to animal parasites in general.

The text opens with a brief discussion on the importance of a knowledge of human parasites and how any practitioner can readily gain this knowledge. One chapter is devoted to the microscope, and one to the preparation of films or smears and their examination for parasites. Chapters IV and XXII inclusive deal with the various parasites affecting man. One chapter is devoted to the Spirochetacea, 6 chapters are given to the Phylum Protozoa, 7 to the Phylum Platyhelminthes, 3 to the Phylum Nemathelminthes, and 1 to a discussion of Myiasis.

Chapter XXIII consists of 11 concise tables showing geographical distribution of worms found in man, the various vehicles in the spread of human parasites, stages of parasites infective for man, parasites and tissues or organs in which they are found and the diagnostic features of parasites. Drugs used in treating the diseases considered with dosages are briefly discussed.

The text is very well illustrated, including 16 full page diagrams showing life histories of human parasites. The brevity, simplicity and clear-cut descriptions of those characters in the various parasites which have immediate diagnostic value are especially commendable features of the text.

L. HASEMAN

The **Canadian Mother's Book**—*By Helen Macmurchy, M.D. National Health Publication No. 2, Dept. of Pensions and National Health, Canada,* 1932. 228 pp.

Full of flavor and of a style all its own is this little manual for the Canadian mother; popular, too, judging by the inscription "Eighth Hundred Thousand" on the title page. It is written in simple, colloquial language and one might well imagine that it might prove very comforting to many mothers—especially those of the less sophisticated type. Throughout the book national pride is appealed to by way of reinforcing the precepts laid down. In print and spacing, this book is in agreeable contrast to most governmental publications issued on this side of the international border.

One criticism might be made of nearly all "books for mothers," including this one. If the prospective mother is urged and expected to go to the family physician, it seems inadvisable to go into too great detail as to what the physician will do and tell her to do: there may be differences of opinion between the writer of the book and the physician, to the bewilderment of the patient.

MERRILL E. CHAMPION

Behind the Door of Delusion—*By "Inmate—Ward 8." New York: Macmillan,* 1932. 325 pp. Price, $2.00.

This book was written by a brilliant newspaper man, a finished speaker, and an active figure in civic affairs, but unfortunately, according to his own confession, he was addicted to the excessive use of alcohol, so much so that after one debauch which pretty nearly ended his earthly career, he was put in an insane asylum of his own volition, where, at the time the book was written, he was still staying until he got rid of an insatiable craving for liquor. It is dedicated "To a better understanding of those on the inside by those who are not yet locked in."

All through the text there is evidence of an acute mind, a keen observer, and an analytic power. The stamp of sincerity and honesty is there, and the book will be a revelation to all who do

not know the inside workings of the ordinary mental hospital, or as they have in the past been called, insane asylums. From cover to cover, it is full of interest to any thinking reader, but especially to physicians and social workers who come up against the problem of drink. His observations of the insane accord in some respects with those of Clifford Beers in *The Mind That Found Itself*. The diagnoses of new cases by old inmates are generally correct and promptly made. Their mode of expressing this diagnosis is usually amusing. Many keep happy, but the pathos of the situation lies in the universal desire to go home. The most striking indictment in the book is of the asylum attendants, most of whom lack conscientiousness, patience, and the mental ability for the thorough study and understanding of each patient which is essential. Many are drifters, going from one asylum to another and obtaining jobs which they hold only until they are found out.

We commend the book to all who are interested in this tremendous problem of modern life. MAZÝCK P. RAVENEL

The Sputum—Its Examination and Clinical Significance—*By Randall Clifford, M.D. New York: Macmillan,* 1932. 167 pp. Price, $4.00.

This book will serve as a valuable reference and text for physicians, laboratory workers and students. It is concise, simply written and well indexed.

Directions are given for collection of sputum specimens for examination, and the author emphasizes the importance of postural drainage as an aid to the patient in raising sputum. Methods and materials for sterilization of the sputum are discussed.

Macroscopic and microscopic examinations are dealt with separately, with descriptions given of the common findings. There are many colored plates and photographs to supplement the text.

The last part of the book is concerned with the character and clinical significance of the sputum in relation to some of the more common diseases of the respiratory tract. The author attempts to aid the clinician and laboratory worker in the diagnosis of lung and bronchial diseases by descriptions of the various types of sputum raised in each case.

He points out the outstanding physical characteristics of the sputum in lobar pneumonia, lung abscess, tuberculosis, and other diseases, together with their significance. Microscopic findings in each disease are added. Several pages are devoted to "Pneumoconiosis" or the different forms of pulmonary fibrosis due to dust inhalation. He stresses the importance of sputum examinations in such cases due to the frequency with which they are confused with pulmonary tuberculosis. Laboratory tests and technic are given to aid in correct diagnosis.

The book contains 167 pages with excellent bibliographies at the end of each chapter. C. C. YOUNG

The Purchase of Medical Care Through Fixed Periodic Payment—*By Pierce Williams, National Bureau of Economic Research, Inc., New York,* 1932. 308 pp. Price, $3.00.

This report is based on the results of a survey aimed to throw light on the extent to which the people of the United States make use of the principle of insurance in order to secure medical and hospital care. The study was conducted largely by correspondence by the writer, who is a member of the research staff of the National Bureau of Economic Research, upon the invitation of the Committee on the Costs of Medical Care. Emphasis was placed on medical and hospital care "in kind," only minor discussion being given to accident and health insurance.

Consideration is given to fixed pay-

ment medical service in the lumber and mining industries of various states, to a hospital contact system, to service for railroad employees, to group clinics, community health associations, and to certain benefit funds. This will be a useful reference book for several types of students, but is hardly essential, certainly at the price, for health workers.

IRA V. HISCOCK

Normal Youth—And Its Everyday Problems—*By Douglas A. Thom, M.D. New York: Appleton,* 1932. 368 pp. Price, $2.50.

This latest book of Dr. Thom is on adolescence. It is a very clear presentation of many of the internal experiences of the adolescent child and influences in his environment which affect his development during this period. For this reason, there is a great deal of emphasis placed upon home and school influences and their effects. Case histories are given in abundance, each one emphasizing the particular point or points that have been discussed. In this manner, Dr. Thom clarifies and illustrates the practical application of his theoretical discussions.

His presentations of sex problems and their nature are set forth with great frankness. Some may question the wisdom of this in a book that will be read so widely and, therefore, by a number of people who, for any of a number of reasons, will not be able to accept this boldness.

This very objective presentation of sex materials is certainly desirable in books whose circulation is limited to certain professional groups. However, anyone who has had any clinical experience with these problems realizes how skillfully this subject must be presented to most lay and some professional individuals in order not to produce resentment. This frankness may serve, therefore, to increase, in the minds of many readers, their resistance to the understanding and acceptance of the viewpoints presented rather than to diminish them.

There is no discussion of the value or rôle played by religion or objective morality. As there are many people of different religious faiths to whom religion and moral values are of utmost importance in influencing their mental health, it seems that a book of this nature, concerned with the "whole" child, should have given more than passive reference to this group of influences. Moral and religious values are dominant characteristics of the healthy and well integrated individual. These values cannot be ignored in any type of constructive therapy that aims to build up the total personality of the individual.

His approach to the problems of adolescence is essentially dynamic and analytic. The influences of Freud on the author's interpretation of these problems is evidenced throughout.

The author has a very clear style with the result that this book is by no means difficult to read. It consists of eleven chapters and an index. It has much value to the person who is interested in obtaining a knowledge and insight into many of the problems that are characteristic of adolescence and especially those conditions which impede or aid the child's attempt at adjustment and development during this period.

FRANK J. O'BRIEN

Die Arbeitsbehandlung zur Reform der Lungenheilstätten—*By Prof. Dr. Hanns Alexander and Kurt Alexander, Volkswirt. Leipzig: Georg Thieme,* 1932. 100 pp., 44 figs. Price, M. 5.

This is a very fully illustrated account of recent developments in Europe, especially in Switzerland, Holland, and Germany, of the problems of employment in sanatoriums for tuberculous

patients. Employments available or in use in the institutions are treated from the standpoints of purpose, choice, adaptability. direction and control, costs with financial support and returns, selection of articles to be made, incentive, and compensation. The therapeutic values are considered, and types of intellectual occupations for middle-class patients are discussed with reference to their social and public relations.

A full account is given of the organization, administration, and details of such a sanatorium at Agra near Lugano, in which intellectual and professional work is fostered instead of handicrafts. Labor in trades and handicrafts is described in considerable detail from twelve other prominent European institutions. C. A. KOFOID

The International Medical Annual—*By Carey F. Coombs and A. Rendle Short, editors, and twenty-nine contributors. New York: Wood,* 1931. 551 pp. (illus.). Price, $6.00.

A useful volume rather difficult of adequate description in limited space. It is a kind of dictionary of "practical medicine," written by 31 men from the British Empire, mostly from England. In the language of the fly-leaf, it is "A Review of the Year's Work in the Treatment of Disease," in which they include everything from chemical therapeutics to vaccination and surgery. However, the editors inform us that they studiously omit pathology, animal experimentation and mere theories. All items are arranged alphabetically.

Typical of the treatment given the various subjects, scarlet fever might be mentioned. Following brief cross references, such phases of the disease as epidemiology, etiology, symptoms and complications, Dick test, prophylaxis and treatment are reviewed by Dr. J. D. Rolleston, while Dr. G. E. Oates handles the subject of management. Nineteen references to recent literature are used—the reviewer often agreeing with the papers before him. It is interesting to note that the opinion is concurred in "that until a technic is available that is sufficiently precise to identify the scarlet fever organism as well as sufficiently simple for general application, the control of scarlet fever must continue without the aid of throat cultures." On the whole, the book should find a hearty welcome on every practitioner's shelf.

C. F. ADAMS

Epidemiology. Historical and Experimental—*By Major Greenwood, F.R.S. Baltimore: Johns Hopkins Press,* 1932. 88 pp. Price, $1.50.

A generous modesty gracing fundamental scholarship characterizes this tiny volume, which contains much wisdom on one of the broadest fields within the disciplines of medicine.

Dr. Greenwood, himself a distinguished successor to the epidemiologists of history, most sympathetically appreciates and relates the merits of ancient contributions to our understanding of disease as a herd or mass or group phenomenon. We are carried in the first chapter from the book of Epidemics of Hippocrates past the foggy theories of Galen into the threshold of modern epidemiology opened to us by Fracastoro. From Sydenham, the clinical colussus, there came but little of great value to epidemiology except a conception of epidemic succession. Then follow Graunt, Henle, Farr, Simon, Ross, and Brownlee, masters and teachers, all leading directly to their peer of today, the present author.

In the second and third chapters we meet the rigorous discipline of the experimentalist, a pioneer in the new epoch wherein bacteriologist and statistician join forces to pose questions and prove answers.

Nowhere else can so concentrated a statement of the philosophy, the argu-

ment, and planned and controlled experience to elucidate human and animal herd experience with disease be found.

While the experimental experience is with communicable disease, the principles of inquiry and the reasoning involved are of no different order from those required in epidemiological study of occupational diseases of mass significance.

The *Pasteurella* and the multitude of mice as studied by Greenwood and Topley have illuminated some dark places, and created shadows where false light shone before. The laboring epidemiologist, the statistician, laboratory director, and teacher of public health will find this charming volume a precious companion of their thoughts.

Paper, print, tables, graphs and references are worthy of the text.

HAVEN EMERSON

Medical Entomology — *By Robert Matheson, Ph.D. Springfield, Ill.: Charles C. Thomas,* 1932. 502 pp. Price, $5.00.

This volume is a scholarly presentation of the present known facts concerning the spread of disease by insects and their allies. It deals with the subject primarily from the entomologist's angle. The medical diagnosis and treatment are only touched on briefly, these being properly left to medical publications.

The text opens with a brief historical discussion on the Arthropods and human disease, followed by discussions on insects and their allies, the rôle of ticks and mites, the Hemiptera or true bugs, and the lice. The Diptera or flies and their allies are by far the most important carriers of disease, and 10 of the 20 chapters are devoted to them. Of the Diptera, the mosquitoes are the most important disease carriers and special consideration is given to them, their identification, and means used to keep them under control. Besides the mosquitoes, the Psychodidae, the Tabanidae, the blood-sucking nemocerous and muscoidean flies, and the house fly are considered as carriers of human diseases. A chapter is devoted to Myiasis, one to the rôle of fleas in the spread of disease, and one chapter to poisonous biting, stinging, nettling, and blistering insects and allied Arthropods. The final chapter is devoted to the collecting, rearing and mounting of insects for study.

A feature of the text is the tables and keys for identifying the various species of Arthropods considered. The illustrations are good, and while not numerous, are well selected. It was written as a textbook for classes in medical entomology, but the practitioner will also find it a valuable and an authoritative reference text. It is one of the best on the subject available, and up to date.

LEONARD HASEMAN

Manual of Bacteriology and Pathology for Nurses—*By Jay G. Roberts. (6th ed.) Philadelphia: Saunders,* 1932. 259 pp. Price, $2.00.

As the title indicates, this is intended to be a textbook for student nurses. The section dealing with bacteriology reveals much evidence of inefficient revision. As an example, in some places streptococci are given as the cause of scarlet fever and in other places, this disease is classed with those of unknown causation.

However, such inconsistencies are slight as compared with some of the statements concerning bacteriological reactions and particularly those involving the subject of immunity. A few instances are too flagrant to overlook. The names applied to the various streptococci are confusing and certainly do not correspond with any logical nomenclature. It is hard to understand the author's division of bacteria on the basis of pus formation

as the reader would certainly conclude that this process was limited to the activities of the streptococci and staphylococci.

No mention is made of the occurrence of melitensis infection in the United States. It is unfortunate that typhoid vaccination is used as an example of the value of the opsonic index. Why should the plague bacillus be classed with the anaerobes when the organism is described as a facultative anaerobe?

Although the author prides himself upon presenting the latest material, the infective agent of yellow fever is stated to be *Leptospira icteroides*, and old terminology is used to describe the mosquito vector. Some little used methods for making the tuberculin test are described, but the Mantoux method is not even mentioned. Allergy and serum sickness are certainly not synonymous terms and should not be classed under the general title of "anaphylaxis," which term comes from the Greek and not from the German, as stated.

It might be possible to forgive many of the errors if the description of the Wassermann test was not so confused as to make it almost unrecognizable. On the other hand, most of the section on pathology is well written and quite correct. Even here, when the author reverts to bacteriological discussions, he is apt to slip. It would hardly be fair however, to leave the impression that the book is worthless. No such thing is intended. Much of the material is in such form that it can be readily assimilated by the elementary student. At the same time, it is hard to understand how so many errors can exist in 250 small pages. JOSEPH A. KASPER

Magazine Publishing—*By Lenox R. Lohr. Baltimore: Williams & Wilkins*, 1932. 328 pp. Price, $4.00.

Everyone who has the supervision of a publication, whether bulletin, pamphlet, or magazine, will find this a guide as to how to go about the myriad tasks which arise and which commonly have to be learned by experience or from that equally bitter teacher, the printer.

Mr. Lohr tells the editor how to manage his assistants, prepare his manuscripts and illustrations, and carries him through the whole process of deciding the most attractive and effective make-up and typography, besides introducing him to an intelligent comprehension of details of the printshop.

The chapter on editorial detail, including a page of proofreaders marks, will enable the editor to know and do what the printer expects of him. Mastery of its advice will insure good relations with those who must eventually carry every piece of printing to its final form in paper and ink. The book, though indexed, is not as well organized as it might be for grasping a desired bit of information instantly, but it does contain exact data regarding more of the innumerable tasks connected with publication than any other volume this reviewer has seen. FRANCES GRINSTEAD

Student's Handbook on Nursing Case Studies—*By Deborah MacLurg Jensen, R.N., B.S. (2nd ed.) New York: Macmillan*, 1932. 129 pp. Price, $1.25.

The social phase of a patient's life is very often disregarded or little thought of in relation to his physical illness. Very often, as in the cases of some mental patients, the difficulty lies in their maladjustment to social conditions. In Jensen's *Student's Handbook on Nursing Case Studies*, the side of illness, its importance, its relation to the patient before entering and after leaving the hospital, are greatly emphasized and clarified in all types of cases.

This book is the only one of its kind published and should be in the hands of every nurse. RUTH ZINKAN, R.N.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Toxoid Replaces Toxin-Antitoxin—An announcement of unusual import comes from the New York City Department of Health: "Improvements made in the preparation of diphtheria toxoid," its bulletin says, "have led the Department of Health to discontinue the manufacture of toxin-antitoxin and to use toxoid in its place." Advice about dosage follows.

ANON. Toxoid Instead of Toxin-Antotoxin. Weekly Bull. 21, 48:377 (Dec. 3), 1932.

Rural Health Prospers—Despite the financial difficulties of the times, county health administration made in 1931 the best record of recent years—a net gain of 59 new county units.

ANON. Extent of Rural Health Service in the United States, 1928–1932. Pub. Health Rep. 47, 51:2299 (Dec. 16), 1932.

Aids Malaria Control—Two studies in Alabama confirm the proposal that plasmochin administered to a population will lessen malaria because it renders the human carrier non-infectious to mosquitoes. This ought to please the anti-vivisectionists. In all seriousness, it suggests that the use of the drug is a valuable addition to our present methods of malaria control.

BAKER, J. N. and GILL, D. G. Plasmochin in Malaria. Pub. Health Rep. 47, 49:2245 (Dec. 2), 1932.

Does Cancer Control Pay?—The Massachusetts cancer program is evaluated and found to pay real dividends on the sum invested by the state. Stimulating.

BIGELOW, G. H. and LOMBARD, H. L. Economics of the Massachusetts Cancer Program. New Eng. J. Med. 207, 22:972 (Dec. 1), 1932.

Random Thoughts on Milk-borne Sore Throat—Two definite conclusions are arrived at in this rather discursive paper: One, that there is a great deal that we do not know about streptococcus infections. Two, that unless it is possible to apply rigid precautions against mastitis, the only safeguard against septic sore throat is pasteurization. To both conclusions we can all agree.

BROOKS, P. B. Epidemiology of Septic Sore Throat. New York State J. Med. 32, 23:1348 (Dec. 1), 1932.

Pneumonia and Heat—Steel workers whose jobs subject them to extremes of heat and humidity have markedly higher death rates from pneumonia than do general workers in the same industry. Preventive measures are proposed.

BRUNDAGE, D. K. and BLOOMFIELD, J. J. The Pneumonia Problem in the Steel Industry. J. Prev. Med. 14, 10:345 (Dec.), 1932.

Another Progress of Nutrition Report—This annual statement of the progress of research in nutrition is unusually complete, making it a mine of information for the casual student of the subject.

BURNETT, F. L. The Progress of Nutrition. New Eng. J. Med. 207, 33:1040 (Dec. 8), 1932.

Syphilis in Industry Again—Three articles on methods of providing medical treatment for syphilis among workers through various industrial health insurance or health service schemes.

CLARKE, W. *et al.* Syphilis An Industrial Problem. J. Social Hyg. 18, 9:481 (Dec.), 1932.

Does Age Lessen Industrial Value?—This Chicago study of reaction times stresses the industrial use-

fulness of the man over 40. Persons in the age group 40–59 had fewer accidents and less absenteeism on account of illness than younger men.

FISHER, H. E. Are We Old at Forty? Indust. Med. 1, 2:78 (Nov.), 1932.

Tonsils vs. Colds in Adults—In a group of adults, some with and some without tonsils and adenoids, there was found to be no significant difference with respect to attacks of common colds between the two divisions.

GAFAFER, W. M. Adeno-Tonsillectomy and Disease of the Upper Respiratory Tract (Common Cold) in Adults. J. Infect. Dis. 51, 3:489 (Nov.-Dec.), 1932.

Rights to Potable Water—Although this paper is a technical engineering and legal treatise, it succeeds in becoming a most interesting discussion of the use of potable water. It dwells largely with the celebrated Delaware River Case.

HORTON, R. E. Water Diversion Between Drainage Basins. J. Am. W. W. Assn. 24, 11:1623 (Nov.), 1932.

Citius, Altius, Fortius—About all that can be said concerning the value of physical education in its relation to general health culture and welfare here and abroad is said at its best in this extensive symposium.

LAPORTE *et al.* International Olympics Conference on Physical Education. Physical Education Review 3, 9:16 (Nov.), 1932.

Faulty Fixtures—Here are set forth the possibilities of contamination of water through faulty plumbing fixtures which permit siphonage through cross-connections and methods of testing.

MORRIS, S. B. Cross-Connections with Public Water Supplies. J. Am. W. W. Assn. 24, 11:1750 (Nov.), 1932.

More About Vaccination Methods—Smallpox vaccination by the intradermal route is advocated after a four-year trial. The reactions are mild, and vesticulation and scarring were trivial or absent.

ROBERTS, B. E. Subcutaneous and Intradermal Smallpox Vaccination. J. Prev. Med. 6, 6:453 (Nov.), 1932.

Salmonella Poisoning — In this scholarly treatise on food poisoning, the author gives his reasons for assuming that the damage is done by undestroyed toxins produced by the salmonella group of organisms. He then gives the objections to this theory and ends with: "I have endeavored to deal impartially with this controversial subject, freely admitting that my views as to causation may be unsound, but giving you the reasons for the faith that is in me." Try to imagine an American writer closing his lecture with such an admission.

SAVAGE, W. G. Some Problems of Salmonella Food Poisoning. J. Prev. Med. 6, 6:425 (Nov.), 1932.

Bacterial Dissociation in Epidemiologic Studies — Do bacteria change in virulence by gradual adaptation during epidemics? The answer to this question will interest every epidemiologist. The paper must be studied to get any worth-while conclusion from it.

ZINNSSER, H. and WILSON, E. B. Bacterial Dissociation and a Theory of the Rise and Decline of Epidemic Waves. J. Prev. Med. 6, 6:497 (Nov.), 1932.

Bacterial Causes (?) of Caries—Despite the fact that we are pretty sure about the dietary origins of dental caries, the bacteriological search for the cause goes merrily on. "*L. acidophilus* was found most frequently in the mouths of those children whose teeth contained three or more cavities." Hence some relationship appears to exist between the germs and cavities, concludes this author, even though he

reports the absence of the organism in many carious mouths, and its presence "rather frequently and consistently" in mouths without any dental caries.

TUCKER, W. H. The Possible Relation of Aciduric and Acidogenic Micro-Organisms to Dental Caries. J. Infect. Dis. 51, 3:444 (Nov.-Dec.), 1932.

Courts Sustain Milk Regulations Reviewing twenty recent court decisions about milk, evidence is presented that courts uphold all reasonable regulations and licensing statutes. There is a reminder here that defective legislation may be the basis for trouble to come.

TOBEY, J. A. Recent Court Decisions on Milk Control. Pub. Health Rep. 47, 49:2250 (Dec. 2), 1932.

Medical Services for Mary Jones—A skeptical medical profession is told how much the now famous program proposed by the Committee on Costs will do for the doctor's welfare. How the new and superior service will be rendered to Mary Jones is also set forth, but nothing is said about the method of inducing Mary Jones's father (and 25 million other fathers) to pay a rather high fee ($36.00 per person) for services that may not be needed.

WILBUR, R. L. The High Points in the Recommendations of the Committee on the Costs of Medical Care. New Eng. J. Med. 207, 24:1073 (Dec.), 1932.

Respiratory Diseases Menace Childbirth—Despite surgical asepsis puerperal infections persist, the curve of incidence follows the incidence curve of respiratory infections at a somewhat later date.

WILLIAMS, J. T. The Relation of Respiratory Infections to Puerperal Infections. J.A.M.A. 99, 24:1992 (Dec. 10), 1932.

The Last Word About "Committee on Costs"—By far the ablest presentation of the proposals for socialized medicine. The problems are honestly and openly stated. For instance: if we are to invoke the insurance principle, we must guarantee the best medical care; provide the intimate service of the family physician, plus specialized aids: assure economy and efficiency. *Can we?* (Ed.) Although compulsory participation is the logical solution, the committee proposes experimenting with various voluntary schemes until the right way is found.

WINSLOW, C.-E. A. The Recommendations of the Committee on the Costs of Medical Care. New Eng. J. Med. 207, 25 (Dec.), 1932.

BOOKS RECEIVED

HOOKWORM INFECTION. By Clayton Lane. New York: Oxford, 1932. 319 pp. Price, $6.25.

HOW TO DEVELOP YOUR PERSONALITY. By Sadie Myers Shellow. New York: Harper, 1932. Price, $3.00.

HABITS: THEIR MAKING AND UNMAKING. By Knight Dunlap. New York: Liveright, 1932. 326 pp. Price, $3.00.

MEDICAL CARE FOR THE AMERICAN PEOPLE. The Final Report of the Committee on the Cost of Medical Care. Chicago: University of Chicago Press, 1932. 213 pp. Price, $1.50.

A SUGGESTION FOR AN EXPERIMENTAL ATTEMPT AT LOCAL IMMUNIZATION IN POLIOMYELITIS THROUGH IRRADIATION OF THE PORTALS OF ENTRY. By S. Peskind. Cleveland: Mount Printing Co., 1932. 15 pp.

THE SEX TECHNIQUE IN MARRIAGE. By Isabel Emslie Hutton. New York: Emerson Books, 1932. 160 pp. Price, $2.00.

RECENT SOCIAL TRENDS IN THE UNITED STATES. Report of the President's Research Committee on Social Trends. New York: McGraw-Hill, 1933. 1568 pp. Vols. I and II. Price, $10.00.

A STANDARD CLASSIFIED NOMENCLATURE OF DISEASE. Compiled by the National Conference on Nomenclature of Disease. New York: Commonwealth Fund, 1933. 701 pp. Price, $3.50.

NEWS FROM THE FIELD

A.P.H.A. MEMBERS HONORED BY ROYAL SANITARY INSTITUTE

THE Royal Sanitary Institute of Great Britain has elected two of our members to Honorary Fellowship—George A. Soper and Mazÿck P. Ravenel.

George Albert Soper is an engineer by profession, a graduate of the Rensselaer Polytechnic Institute. He received his M.A. and Ph.D. degrees from Columbia University. He has been a member of our Association since 1895 and is a Charter Fellow. He was the discoverer of "Typhoid Mary," the most famous carrier in medical history. He was the first to report an outbreak of influenza in the Army in 1918, in which he served as Major of the Sanitary Corps, and framed the 12 rules proposed by the Surgeon General and promulgated by President Wilson. From 1923 to 1929 he was Managing Director of the American Society for the Control of Cancer. For some years past his attention has been directed particularly to street cleaning and the disposal of garbage. He is Chairman of a joint Committee of the American Society of Civil Engineers to investigate the subject and to promote education in regard to it. He has taken interest in many civic affairs, and has had many positions of great credit and honor. He was engineer in charge of rehabilitation after the terrible storm in Galveston in 1900, and studied the epidemic of typhoid fever in Ithaca, N. Y. in 1904. He has also investigated the subway air in New York, and served as President and Director of scientific work of the Metropolitan Sewerage Commission.

Mazÿck P. Ravenel, M.D., has been a member of our Association since 1899 and is a Charter Fellow. He retired from the practice of medicine in 1893 and has since been connected with teaching and research work at the University of Pennsylvania, the University of Wisconsin, and the University of Missouri. He was the first bacteriologist of the State Live Stock Sanitary Board of Pennsylvania, and conducted the experiments which proved the danger of bovine tuberculosis to human beings. He was President of our Association in 1920–1921, and in conjunction with Henry F. Vaughan, took over the editorship of the JOURNAL in January, 1922, became Chairman of the Editorial Committee, December, 1924, and Editor-in-Chief in March, 1930, a position which he continues to hold.

The Royal Sanitary Institute has honored other members of our Association in the past in a smiilar way. We appreciate its action at the present time, and feel sure that it will further cement the very cordial relations which have existed between our Society and the Royal Sanitary Institute.

CLEANLINESS INSTITUTE

CLEANLINESS Institute has arranged with the National Tuberculosis Association for the distribution of the educational materials created by the Institute for public use, through the association's state and local branches and affiliates. On account of a drastic reduction in the budget for its educational services in 1933, the Institute has been obliged to discontinue its own distribution of these booklets, school readers, posters, etc.

The transfer of this material from the headquarters of the Institute at 45 East 17th Street, New York, to the various state tuberculosis associations should be completed by February 25.

Health officials, schools, writers, industrial executives, public health nurses and others, may obtain this material from the association in their own state after this date. Hereafter, all requests for publications received by the Institute will be referred to the National Tuberculosis Association or to the appropriate state association.

The curtailment of the Institute's educational service has required also the discontinuance of the staff heretofore associated with this work. Under these circumstances, Roscoe C. Edlund, the general director, announces that the Institute cannot continue extensive correspondence, field service and detailed assistance, but that he will be glad to serve as far as possible in continuing Institute contacts. Mr. Edlund requests that all correspondence be addressed either to him or to Cleanliness Institute.

PSITTACOSIS

THE discovery that native birds of the psittacine family in California now harbor the disease "psittacosis," and that it is therefore no longer solely an importation was made by the California Department of Public Health under the direction of Dr. Karl F. Meyer, Director of the Hooper Foundation for Medical Research, San Francisco. Research into the prevalence, transmissibility, the carrier state in birds, and possibility of infection in birds other than psittacines, is now going on in the Hooper Foundation Laboratories.

PUBLIC HEALTH SURVEY

A SURVEY of public health work in Delaware County, Pa., will shortly be begun by Dr. Joseph W. Mountin, F.A.P.H.A., of the U. S. Public Health Service, through the coöperation of the county medical society, the county tuberculosis association, and other health and civic agencies. It will be the aim of the survey to obtain accurate information on all health activities of the county, to formulate effective methods for preventing and combating epidemics, to coördinate the work of agencies in the health field, and to prevent and correct overlapping and waste of effort.

NEW MILWAUKEE HEALTH CENTER

THE Matthew Keenan Memorial Health Center, a gift to the city of Milwaukee by the late Matthew Keenan, was opened recently. The cost was $150,000.

NATIONAL CANNERS ASSOCIATION CONVENTION

THE Twenty-Sixth Annual Convention of the National Canners Association, the Canning Machinery and Supplies Association, and the National Food Brokers Association was held in Chicago January 23–27.

PERSONALS

JAMES H. ELSON, who retired 10 years ago as Chief Inspector of the Health Department in Jamaica, Queens, New York, died December 1. He spent 20 years in the Health Department, starting as an inspector of the Bureau of Sanitation.

DR. OGILVIA C. RICKSECKER, of Wilmot, was appointed Health Officer of Stark County, Ohio, to take office January 1. He succeeds Dr. Floyd R. Stamp, of Alliance.

JOHN W. BROWN, M.D., member A.P.H.A., who has been Health Officer of El Paso for 5 years, is the new State Health Officer of Texas. He succeeds Dr. J. C. Anderson, F.A.P.H.A.

DR. P. HERNANDEZ LIRA, member A.P.H.A. has been appointed Director of the Training Station for Public Health Workers, sponsored by the Mexican Public Health Service and the Rockefeller Foundation.

DEATH

DR. LOUIS CANTOR, member A.P.H.A. since 1928, died January 10 in Jerusalem. He was chief sanitary engineer of the Palestine Government. Dr. Cantor was born in Syracuse, N. Y., gained his first engineering experience at the Panama Canal under General Goethals, and subsequently was an engineer for the City of New York. In 1918 he went to Palestine with the first contingent of the Hadassah medical unit and was placed in charge of the anti-malaria campaign there. He was 48 years of age.

CONFERENCES

February 6–10, American College of Physicians, Seventeenth Annual Clinical Session, Montreal.

February 13, 14, Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association, Chicago, Ill.

March 21–25, Fourth Pan-American Medical Congress, Dallas, Tex.

April, American Physiological Society, Cincinnati, Ohio.

April 3–8, New York Food and Health Exposition, Grand Central Palace, New York, N. Y.

April 4–6, American Water Works Association, Southeastern Section, Albany, Ga.

May 29–31, Western Branch A.P.H.A., Pasadena, Calif.

June, State and Provincial Health Authorities of North America, Washington, D. C.

June, State and Territorial Health Officers Conference, Washington, D. C.

June 11–17, National Conference of Social Work, Detroit, Mich.

June 12–17, American Medical Association, Milwaukee, Wis.

June 26–30, National Tuberculosis Association, Toronto, Canada.

July 1–7, National Education Association, Chicago.

July 5–9, International Union of the Protection of Childhood, Paris.

July 18–20, International Congress of Pediatrics, London.

July 10–15, International Council of Nurses, Paris, July 10–12; Brussels, July 13–15.

July 25–29, British Medical Association, Dublin.

July 29–August 4, World Federation of Education Associations, Dublin.

One year ago an investigation of the so-called Vice-squad in New York City created a wave of public indignation. Legislation was enacted so promptly to reform the situation that Mr. Waterman, who was about to publish the results of an extensive investigation which he personally had carried on, had to revise his findings entirely in order to bring his report up to date. The product of his labor is now ready, entitled "Prostitution and Its Repression in New York City (1900–1931)." The work should be of value to individuals and organizations interested in dealing constructively with the problem of prostitution elimination. Published by Columbia University Press, price, $3.00.

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